COAL AGE

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## *Let the Beneficiaries Pay*

TALES of speedy termination of extravagance in executive departments at Washington—of a billion dollars to be cut from appropriations next year and of tens of thousands of civil service employees to be released—sound good to the citizen as he contemplates his individual tax bill. Few would object to having two billion dollars of expenditure cut off, providing it could be done intelligently—that is the problem!

The budget system offers a means of applying impartial analysis to the requests for public money, but do not expect too much from the budget system the first year (which we hope will be next year) because years will be required to develop an organization that can measure up to the requirements.

In the meantime Congress is hearing the various bureaus that do things for the coal industry and is preparing to chop here as elsewhere. We do not believe that in so far as it relates to coal the work of the Geological Survey and the Bureau of Mines can be curtailed without injury to the industry thus served. We are hopeful that Director Smith and Director Cottrell will be able to hold the ground they have gained, but they will need support.

Universal and unnecessary duplication of effort is charged in government work, and Senator Smoot, filled with misinformation by the self-complacent Bureau of Efficiency—fine title, isn't it?—more than a year ago charged endless duplication in the collection of coal statistics. The charge is without foundation except as it applies to the Bureau of the Census, and for that Congress is itself responsible.

The coal industry pays no small share of the taxes that make the income of the United States and as a shareholder in the vast business of our country can demand reasonable returns on its investment in government.

New projects calling for additional expenditures should be examined closely. The Bureau of Mines has again come forward with a request, this time for $750,000 to sample and to certify as to quality of commercial coal shipments. This an an ambitious undertaking and Director Cottrell at the annual banquet of the Coal Mining Institute of America in Pittsburgh, on Dec. 8, suggested that the bureau had no desire to urge such an innovation in coal without the support of the coal industry. Strange as it may seem, appropriation committees are more liable to look favorably on a request for a $750,000 than a modest suggestion for a $5,000 allotment. It is possible that Congress will look on this proposal to guarantee the quality of coal as a panacea for a lot of coal ills and adopt it despite its cost.

We believe in the sampling and testing of coal as measures to insure the consumer getting that for which he pays. The payment for such work, however, is not a proper charge on the public treasury, and if, as seems reasonable, the Bureau of Mines is the proper agent for doing the work, the Treasury should be repaid by collecting fees for the service. If it is worth something to the shipper to have a stamp of the government on his product, and if the consumer desires a measure of protection on his fuel quality, let them—the beneficiaries—pay the cost. Patent fees repay the cost of the Bureau of Patents, passport fees almost meet the total cost of the State Department; why not have a part of the Bureau of Mines thus self-sustaining?

## *No Time for Upward Coal-Wage Revisions*

THE recent rise in the wage of day workers in the bituminous region was really based on a division of profits. Spot prices were abnormally high, and the mine workers felt that they were entitled to a division. They did not so express themselves, partly because it is a principle of the union not to seek wages based on profits, for union men and their leaders do not want wages to be reduced when profits decline and partly because it was the high pay of fly-by-night mines that caused the cry for higher wages all around. But in point of fact the high prices and profits were the cause of the higher wages that were granted to daymen, and those profits and prices have already been decidedly lowered.

A contract is a contract. The bituminous operators must and will keep that to which they have pledged their faith and signed their names. New conditions—the reduced cost of living and the lower prices, both present and prospective—not having been written into the contract cannot be permitted to change it. The wages made at the time the instrument was signed were higher than labor of a similar kind is making the country over, but that is no argument once a contract is made. It must be permitted to run its course. Revision at the end of that time is a matter for consideration later, and the action of the operators in deciding at that time on what they will do will doubtless take into account cost of living, wages current for similar work, public sentiment as to high wages and the high prices consequent thereon.

But the bituminous day wage, being abnormally high and representing conditions which do not reflect and which never have reflected conditions in the anthracite region, should not be duplicated there. The wage in the anthracite mines is based, moreover, on steady work, such as the mine workers in that region, except during strike periods, never fail to enjoy, while the price in the bituminous region is based on part-time operation. Consequently the wage in the anthracite region should not be changed. The Baltimore Coal Exchange is opposed to all negotiations that will result in a revision upward, and in this respect is representative of a sentiment that is country-wide.

## *New Complexities in Export Trade*

SHIPPERS of export coal are experiencing sensations new to many in the trade, who know only the market of last summer. The decrease in demand abroad has been no less sudden and general than the decline in the market at home. Caution has succeeded headlong buying by foreigners, with the French market leading in the slump. It appears that France is far from having in sight the coal she requires for the ensuing year, but a slackening of industry in that country similar in most respects to that in the United States, coupled with unexpectedly satisfactory delivery of German coal, has taken the edge off the French demand. Spain's industries, crippled by universal strikes, are not in the market for coal and Italy has acquired supplies sufficient to warrant holding off for better prices.

The English are now determined to regain all of the former trade their production will permit, for in export trade lies their only opportunity for profit. In the next few months our exporters must learn to do business on a c.i.f. basis in order to meet rejuvenated British competition on a declining market. The all-important point to be developed is how low the British can afford to go, having in mind the settlement recently effected with their mine labor. England must maintain a sizeable share of the coal trade in South America to equalize freights and exchange in her necessary business in wheat, hides, etc., with Argentina and Brazil.

Ocean freights are uncertain as well. Several of the larger American interests have their representatives abroad, which indicates that next year's business so far is in the hands of the buyers. The danger to our foreign trade in coal now is that prices will be named that are as much too low as they were too high last summer. There are items of costs and elements of risk in foreign trade that require a longer margin for the shipper than obtains in the home trade. He who undertakes to deliver coal next year without discounting these features may do the American trade as much damage as those who more than took advantage of the abnormally high market last summer.

## *An Urge or a Restriction*

STANDARDIZATION has been long urged as a means of conservation of labor. The enthusiasts would have every type of instrument modeled after one and that the best. But what is best, and will it be best tomorrow? Let us be careful that we do not set a limit to invention and prevent development. Railroads are all of standard gage. How much better had they been in accord with the gage advocated by Sir Isambard Brunel—six feet instead of four feet eight and half inches! Travel would be easier, cars would be larger, tractive effort would be reduced and all of our railroad engineering on a higher plane. Yet we might easily have compromised on a meter gage, and so have fallen far below our present level of accomplishment.

The figure for mine gages is set by one sub-committee of the Standardization Conference of the American Mining Congress at forty-two inches, but another would add to these gages thirty-six inches and forty-eight inches. Even these gages will hamper development, for some mines are using cars on standard railroad gage tracks, and surely they should not be restrained in pioneering.

This attitude with regard to standardization is quite general. Everyone is a little afraid it may be too successful and clamp our American spirit in too Byzantine a mold. When some over-zealous standardizer wanted to name a lower limit for the weight of power drills—about 25 lb.—one of those who were present at the conference declared that drills used to weigh 200 to 300 lb., and everyone then felt assured that the weight was right, for only a drill of that weight would meet the strenuous demands of underground work.

Now we are down to 35 and 50 lb. and some good drills weigh only 18 lb. or less. No one wants to put a limit on weight, on the maximum size of a clock or the minimum size of a watch. From the old Nuremberg timepieces we have traveled up and down. We shall do the same with drills if standardizers will let us.

Still there is work for standardizers—work enough and to spare. The standardizer will save many a heartache and much waste of time. He will give us more for our money and better thought-out designs. Still let us hope there will always be those who, seeing a need, will break freely with standards as with other conventions, if they impede the progress of mining.

## *Concentrating Tables*

TO EVERYONE at some time has come the vain hope that by comminuting coal it would be possible to divide even bone coal into pure coal, slate and pyrite, the former containing only intrinsic ash. But when the dream had been exposed to the garish day, it was found that the jigs as then constructed failed to separate what crushing had appeared to have so completely parted. The product was too fine to submit to such washing. The waste water of the washery tended to take away coal, ash and pyrite together, so that fine crushing fell into disrepute.

Recently something has been done to remedy conditions. Better jigs, thickeners and concentrating tables have helped, and today it may be said that all the free ash can be taken out of finely-crushed coal and almost all the non-microscopic pyrite, but the intrinsic ash and the organic sulphur cannot be removed. Many a good jig and concentrating table has been condemned because it could not perform those wonders that only chemical action can achieve.

It is remarkable that concentrating tables have not been in larger use. True they take up larger floor space, but that fault is met by the fact that they do not take the same amount of headroom, so the loss in floor space is at least partly met by increasing the number of floors. This can be done without markedly increasing the height of the washery. They cost much less to drive—perhaps one-twentieth as much as a heavy jig—but as their capacity is less, the driving cost per ton of product is only one-fifth as much as with the older form of machine. They take about one-twentieth as much water, and that is often an important consideration. Moreover, they require much less attention after the slope of the table and the feed of water and of raw coal are provided. However, so little has been as yet decided as to jig and concentrating-table service on fine coal that it would be ill-advised at the present time to offer the public a judgment.

New jigs are being developed as time passes. Some of the power costs are being lessened. What time will prove it would be vain to forecast, and perhaps no general dictum will ever be accepted for all coals, but we are getting nearer and nearer to the time when we can arrive at the truth.

# Coal Mining Institute of America Holds Its Most Successful Session

## Institute Has Gained About 51 Per Cent in Membership Within a Year —Meditates Establishing Letter Ballot—Banquet Speeches Are More than Usually Attractive—About Three Hundred Members Present

By R. Dawson Hall
New York City

THOUGH there were but 821 members a year ago, the number had risen to 1,206 when the Coal Mining Institute of America met, on Dec. 8, in the Chamber of Commerce Building, Pittsburgh, 385 new members having been accepted since the last meeting. To this must be added 36 members who turned in their applications at the first session. Instead of deficits such as have too often plagued secretary-treasurers and members in the past was a comfortable balance in the bank of $414.41 and $1,000 of Liberty Bonds. Though this fell behind last year's surplus by $200, there is nothing but prosperity ahead of the organization, and that despite the fact that the dues are only $3 per year. In the twelve months past $2,711.12 was expended. During the past year six members of the institute have died: W. R. Elliott, Horace T. Knight, W. L. McDonald, James D. Simpson, A. C. Stollknecht, H. M. Wilson and Roger Hampson, and appropriate resolutions were offered, accepted and forwarded to their surviving relatives.

**RESULTS OF ELECTION**

A. R. Pollock . . . President
D. R. Blower, First Vice President
J. I. Pratt, Second Vice President
R. Z. Virgin, Third Vice President
Alexander McCanch, W. L. Affelder, W. E. Fohl, E. S. Moore — Executive Board Members
H. D. Mason, Secretary-Treasurer

President Joseph Williams made his annual address, in which he called attention to the power of the Coal Mining Institute of America as the most representative body of coal-mine engineers, coal-mine executives and state and Government officials in America to settle many of those problems which are perplexing the coal-mine industry. The relations between mine workers and executives, he declared, could be greatly improved if the deliberations of the institute were rightly directed. He commented on the fact that among the new members ten different states were represented and six different foreign countries—Peru, Venezuela, China, Mexico, Russia and New Zealand. The institute, he said, was gradually beginning to justify its name.

In this report I shall make no reference to any of the technical addresses or to the discussions of the queries which members had presented for comment. Every item, but one, on the technical program was presented and all elicited much interest among the 300 or more who were present at all the sessions.

The only paper which failed to be forthcoming was "Modern Safety Appliances for Hoisting Shafts and Cages," by William G. Duncan, director of extension work, Pennsylvania State College, that contributor having been compelled by long sickness and death in his family to delay till the coming year the completion and delivery of his paper, on the preparation of which he had already expended no little time and labor.

At the election A. R. Pollock, general manager of the Ford Collieries Co., was elected president, the other names presented being those of E. S. Moore and R. Z. Virgin. E. S. Moore, who is dean of the School of Mines, Pennsylvania State College, withdrew his name. The elected candidate received 98 votes and Mr. Virgin 69. For vice-president D. R. Blower, mine inspector for the Vesta Coal Co., California, Pa., received 124 votes; J. I. Pratt, state mine inspector, of Pittsburgh, 123 votes; and R. Z. Virgin, mining instructor, Pennsylvania State College, 108 votes. The other candidates were W. D. Nesbit, of the Keystone Coal and Coke Co.; W. G. Duncan and W. L. McCoy, safety inspector, Bertha Coal Co., Pittsburgh, Pa., who received 90, 40 and 37 votes respectively.

On vote, it was decided that the policy of the institute be not changed and that the resolution offered by the executive board providing for a reduction in dues to student members be tabled. The students of Carnegie Technical School had paid their full dues and did not desire a lower priced membership with reduced privileges. In fact, as all the members of that school are already men who have had active experience in the mines, they naturally feel as much qualified as many others of equal experience and less training to assist in the direction of the affairs of the institute.

W. E. Fohl, Alexander McCanch, W. L. Affelder, E. S. Moore, Joseph Williams, W. P. Pilkington, W. L. McCoy and A. C. Callen were then nominated for board members. Mr. McCanch received 94 votes; W. L. Affelder, 88; W. E. Fohl, 82, and E. S. Moore, 79 votes. They were declared elected. H. D. Mason, whose salary is set at $300 a year, was elected secretary-treasurer by acclamation.

It was proposed by W. L. Affelder that at the next meeting shall be discussed a change in the bylaws which would constitute the executive committee as a nominating board, requiring them within thirty days of the meeting to prepare a ballot showing at least two names for each office, leaving a space for each member to fill in a third name if he so desires. The ballots thus voted are to be returned to the secretary-treasurer for count within ten days of the meeting. This arrangement will make it possible for the secretary-treasurer to announce the elected officers at the opening of the session and thereby save much undue delay and confusion. Mr. Affelder declared that at the meeting, out of 1,242 members, only 167 persons voted for president. This inadequate vote would be increased if ballots were sent to the homes of the members. The proposition was strongly opposed by Richard Maize, state mine inspector, of Uniontown, and it was carried by the close vote of 65 to 58. A year from now will decide whether the vote was merely for an opportunity to decide on the matter, or a real declaration in favor of that method, which, by the way, is already the usual system of voting in all large institutes.

### Indigestible Elements in Our National Diet

W. L. Affelder presided at the banquet. The Rev. Dr. John McDowell, secretary of the Presbyterian Board of Missions, who did his first underground work as door boy at Maltby Colliery in the anthracite region, getting that work so early in life that he could only secure it by misrepresenting his real age, made, perhaps, the most interesting address of the evening. He advanced from door boy to nipper, or mule leader, and then to mule driver. While he was doing this work he was severely injured, losing an arm and receiving several other injuries, so that his father was obliged to give him a good school and college training to make up for these physical defects. His talk emphasized the importance of the human element in mining, and the fact that after all the industry could not function without the correct impulse of the hearts of those engaged in it.

Frank J. Raymond, of the Inter-Racial Council of New York, spoke on the aims of the Council: Friendly relations between the immigrants and American workmen, reduced labor turnover, and selective immigration. He declared that the American Federation of Labor sought to exclude all foreigners for a long period if not indefinitely. The Inter-Racial Council believed that selective immigration would not be conducted on sane grounds so long as it excluded merely those who were unable to support themselves were illiterate.

Many highly literate foreigners were distinctly undesirable. Moreover, when admitted some attempt should be made to distribute them and prevent colonies of foreigners forming indigestible elements in our national economy. He said that in one-half of the country there were about 5,000 colonies of foreigners.

Dr. Riley F. Little, of the Safety Institute of America, New York City, also spoke on co-operation, urging that the workmen needed not only wages but justice, opportunity and security. Every man likes to feel he has treatment to which he is entitled, opportunity to rise to such places as fit his abilities, and a security that he and his family will be assured against misfortune in the years to follow.

Jack Armour, of *Coal Age*, made an address under two heads: "Shortage of Men," and "What Are You Going To Do About It?" It was not discoverable that what he said threw any light whatever on the subject, but many of those who heard his speech are laughing yet in unexpected moments and trying hard to explain their inexplicable behavior.

### Word Regarding the Coal in the Balkans

Howard I. Smith, consulting mining engineer to the Kingdom of the Croats, Czechs and Slovenes, former member of the U. S. Bureau of Mines and mining engineer of the Vandalia Coal Co., spoke on the political problems of the country where he has been engaged as consultant. He said that the coal of the Balkans was principally of lignitic character, although some small areas showed coal running up to 15,000 B.t.u. The coal varied from most any thinness up to 150 ft. thick, though this largest deposit of all had only 100 ft. of pure coal. At the present time seventy-seven mines were operating. He had visited all these and several that had been worked in Roman times and had been reopened by the Germans.

The mines do not have a large output even where well equipped. Those operated by the French are producing daily only 0.28 ton per employee, and at one mine, where the coal is 10 ft. thick and found in a favorable condition for mining, 0.8 ton per man employed is the daily output. The power plants are up to date, but an immense amount of coal is used—at one plant one ton out of every five mined, at another one out of every seven, at another forty tons out of every 140. Some of the mines have an extremely low production. In six shaft-mines thirty tons were produced in operations of three shifts. Much work has been done in the use of liquid oxygen, because it has been most difficult to obtain all other kinds of explosives, as railroad facilities are lacking. All explosives must come through German or Austrian territory. The Teutons will not let their own cars go out of their country and keep all railroad equipment that is allowed to cross the line.

### Would Test Coal for All Who Desire It

Dr. F. G. Cottrell, director of the U. S. Bureau of Mines, completed the evening by remarks on the proposed work of that bureau in relation to the testing of coal. He said that the bureau compelled no one to submit explosives to its approval but, having established such a means of testing explosives, many manufacturers were well pleased to submit such of their products as they believe would meet the approval of the bureau and receive its certification.

Similarly operators at their pleasure will be able to name certain mines the product of which they desire to be certified as being of a definite quality. The Bureau of Mines will sample and analyze the coal as found in the cars, will determine on the class in which such coal can be placed, and will then, by sampling and analysis of the necessary frequency, find out whether the coal can continue to receive that certification or must accept a position in an inferior class. The development of this plan depends on the willingness of Congress to grant the necessary appropriation. Unless the industry shows an interest the money will be obtained with great difficulty. Some of the sampling and analysis is already being done by the bureau for the Tidewater Exchange.

A. R. Pollock, the new president, then made a graceful acknowledgment of the honor he had received in his election, thus fitly closing the function.

# Under the Microscope Coal Has Already Lost Much of Its Former Mystery—II*

## Resins in Bright Coal So Little Changed That We May Be Able to Convert Them Into Varnishes—Spores in Dull Coal and Oil Shales Provide Most of the Oil and Gas—Resins and Species of Spore and Pollen Cases Still Distinguishable under Microscope

By Reinhardt Thiessen†
Pittsburgh, Pa.

PEAT is a deposit of semi-decayed and semi-macerated plant products formed in a wet or poorly drained area. In it are found all the plant products that a plant growing in it may yield. The woody plants are by far the most important and the most abundant in the peat-forming processes, and woody matter forms by far the largest part of the deposit.

The best examples are the deposits formed of and now covered with dense growths of trees adapted to a very wet condition. As already intimated, the plant products are semi-decayed and in various stages of maceration. The harder or more woody parts have resisted maceration more than the softer parts, such as bark, young parts, leaves, etc. But much of the wood also has been disintegrated and has been transformed with the other products of decay into a general débris.

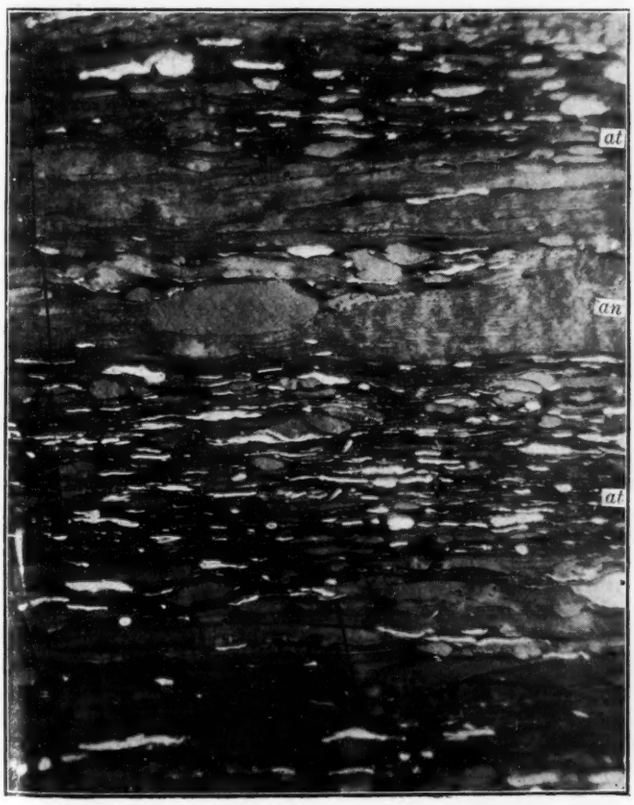


FIG. 1. SECTION OF COAL FROM THE BROOKVILLE SEAM

Shows the general appearance of dull coal; *an* represents thin anthraxylon constituents, and *at* the attritus, the latter composed of spore-exines, cellulosic degradation matter, resinous matter and some inorganic matter. Magnification 155.5 diameters.

FIG. 2. SECTION OF PITTSBURGH COAL

Consists mosfly of attritus including some thin anthraxylon strips and resinous particles. The attritus is rich in spore matter. Magnification 158.8 diameters.

We have then a mass that consists of semi-decayed tree trunks, limbs and roots and fragments thereof embedded in a mass of débris. When this general débris is more closely examined it is found to consist largely of smaller fragments of wood matter in the shape of chips or fragments of stems and twigs. These are again embedded in a mass that consists of very finely macerated plant matter.

It has very much the appearance of mud. When examined under the microscope it is shown to consist of bits of all kinds of tissues and plant cells and fibers of all kinds, as well as of pollen grains, spores, cuticles, resinous matter and some dirt. The mass of this plant material, most of which consists of woody matter, is in a peculiar physical condition. It has been turned into a sort of a jelly that has retained the plant structure and contains more water than plant matter.

### Ascent from Peat to Bituminous Coal

It is the nature of substances in this condition to form a hard, rather brittle mass when dried. Mature peat has exactly that property; it has made the first steps toward coalification, and when dried it is much like coal. Unmatured peat may be brought into this condition by artificial means, and when dried resembles bituminous coal in many respects.

*Article entitled "Recent Developments in the Microscopic Study of Coal" presented before the Coal Mining Institute of America, held at Pittsburgh, Dec. 8 and 9.

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The lignites are similar in composition to the peats, but in the lignites all the plant matter has been compressed, flattened and hardened, and to a larger extent has been deprived of water. Coalification has taken place to a considerable extent, but has not nearly been completed. Indications show that it once was in the same peculiar physical condition as peat.

The sub-bituminous coals, the geologists tell us, were formed at the same time as the lignites. Some are part of the same bed; some in fact are younger than the lignites, but through earth movement or, as the geologists call it, dynamic action, the sub-bituminous coals have proceeded further toward coalification than the lignites. Microscopic examination shows that on the whole they are composed of the same kind of plants and the same kind of plant fragments as the lignites.

It is hardly necessary to say that plant structure has been retained to a large extent in the lignites and in the sub-bituminous coals, but it is important to emphasize that as we go from peat to lignite, and from lignite to sub-bituminous coal the plant structure has been more and more effaced or obscured because the mass has been more and more compressed and hardened and has become more opaque.

### Dull Coal Has Mixture of Bright Matter

When we come to the bituminous coals the coalification, in general, has proceeded still further and hence we should expect the plant structure to be still more effaced, or rather made less evident. The fact is that it has not been effaced, but the structures have been hidden or obscured. The anthraxylon in every coal examined has revealed abundant woody structure (Fig. 3).

The duller portions of the coal are shown on close examination to be composed of numerous thinner strips of bright jetty black coal interlayered by a mass of granular appearance—the attritus. This interleaving of bright and dull strips in the dull coal was well illustrated in Fig. 2 of the first installment of this article, which appeared in last week's issue. The jetty black strips represent, like the larger portions of the bright coal, anthraxylon constituents derived from woody matter. Woody structure is preserved in all of them (Fig. 1). Some of them represent small chips of larger stems, branches, or roots; others represent fragments of smaller branches, twigs or roots, and still others represent twigs, rootlets and the petioles themselves.

### Gradual Transition Between Layers

There is in reality no boundary line between the larger, the smaller and the smallest layers of bright coal. There is a gradual transition in size from the largest to the smallest. It is safe to say that in all of them plant structure is abundantly preserved and that there is not a cubic centimeter of coal in which the plant structure has been entirely eliminated. It may not always be easily discernible in cross-section, but in sections taken horizontally it is always revealed.

The pieces of bright coal are embedded in a mass that has been derived from all kinds of plant products, such as finely macerated woody matter, bark, pith, cortex, leaves, leaf stalks, plant fibers, plant cells and parts of the same, all derived from the cellulosic parts of plants; among these are distributed constituents that stand out clearly, such as resinous matters, spores and pollens. This part is called the attritus (Figs. 1, 2 and 3). Intermingled with this are to be found cuticles, megaspores, sporangium walls, carbonized parts of tissues and plant cells and particles and other mineral matter.

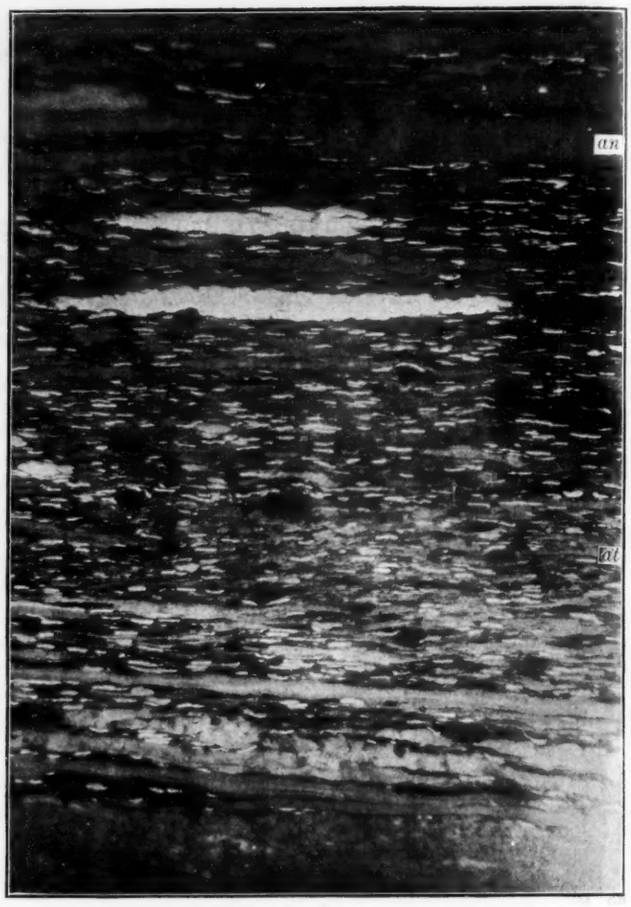



FIG. 3. VERTICAL SECTION FROM UPPER FREEPORT SEAM

Composed chiefly of attritus with a few thin strips of anthraxylon. Magnification 156.5 diameters.

All the vegetable matter has been subjected to putrefaction and decay, and at one time was soft and pliable; it was later compressed and flattened, the flattened parts lying horizontally to the bedding planes. The attritus has been generally referred to as the ground mass, fundamental matter and binding matter. The different constituents named are present in greatly varying proportions. Sometimes the attritus may consist largely of spores instead of woody matter, and then again resinous or cuticular matter, or of earthy material.

In the foregoing analysis it is seen that all the ordinary bituminous coals were derived largely from woody growths. The peat bogs that gave rise to them consisted of wooded swamps similar to those found in Minnesota, Wisconsin and Michigan and the Dismal Swamp of Virginia and North Carolina. The lignites of North Dakota and Montana are analogous to these and form intermediary steps between peat and coal.

By far the largest part of the mass of the ordinary coals, therefore, is made up of woody matter. By woody matter is meant all that which is generally understood under the term "wood," such as tree trunks, branches, limbs, twigs and roots. This wood, of course, is present in various degrees of fragmentation, as already noted. The larger fragments are represented by the bright or glans coal; the small fragments by the thin sheets of bright material in the dull coal. In the attritus there

is further represented woody degradation matter in a finely divided state where it is mixed with other plant matter, such as resins, spores, pollens, cuticles, bark, etc.

It should be noted that besides that part of the plants generally designated as wood, such as the stems, branches and roots, the more delicate part of the plant also contains woody matter. The cell walls of succulent plants, the leaves and their petioles, the bark, growing parts and pith all contain the same substances that compose wood, namely, cellulose and ligno-cellulose. The macerated matter of all of these contributed to the attritus. It is clear, then, that the largest part by far in coal is derived from woody matter, and a very large share is derived from wood; that is, that part of the plant usually termed wood.

Lomax and Glover see but little evidence that coals contain any great amount of matter derived from woody parts of plants, such as stems and branches, and what there is occurs in the form of mineral charcoal. They conclude that the ordinary bituminous coals have been derived mainly from the droppings of trees and plants in the form of spores, fruits, leaves, twigs and sometimes fragments of stems. If this be true our whole conception of coal formation has to be changed. We have here no deposits analogous to that of their conception.

Resins are found in both the anthraxylon and the attritus of coal (Figs. 4 and 5). Much has lately been said about resins in coal. The term, however, is used rather loosely and indefinitely. We read of resins, resinous substances, resinic substances, resinic extracts and resinic residues in coal without a definite knowledge as to what they really are.

### Resins of Many Varieties in Living Plants

In the living plants there are so many kinds of resins that it is hard to define them and bring them all under one head. But in speaking of resins in plants it usually is quite well understood what is meant. They have peculiar characteristics of their own that differentiate them sharply from other substances. Rosin, Canada balsam, gum dammar and tamarack gum are well-known examples.

The chemist who is working with resins has arranged them precisely and systematically into many groups and kindred orders. For him to follow the large and intricate array of resins is as easy a task as to plan the outlay on a coal mine is to the coal-mining engineer.

Under resins are comprised a large number of specific substances, most of which belong to the ring compounds. These may be divided into resin acids, resin phenols, resin alcohols, resin tannins and resenes, each group having a large number of members. Several or many of these, as esters, or as esters and mixtures, form definite kinds of resins; as rosin and Canada balsam. Similarly as fatty acids and alcohol they form fats or oils, as lard, butter and olive oil.

In the peats the resins are easily recognized. They are still found without much change in character in the tissues just where they existed when the plant was living, or they form a part of the attritus, having been set free by decay, and then they are easily determined by means of micro-chemical tests.

In the lignites resins are found both in the anthraxylon, or woody part, and in the attritus, where they are in most cases easily recognized. The woody part of the coal, the anthraxylon, has in most cases been well enough preserved so that generic and in some cases specific determinations can be made, and these resins are found to be closely related to species living today.

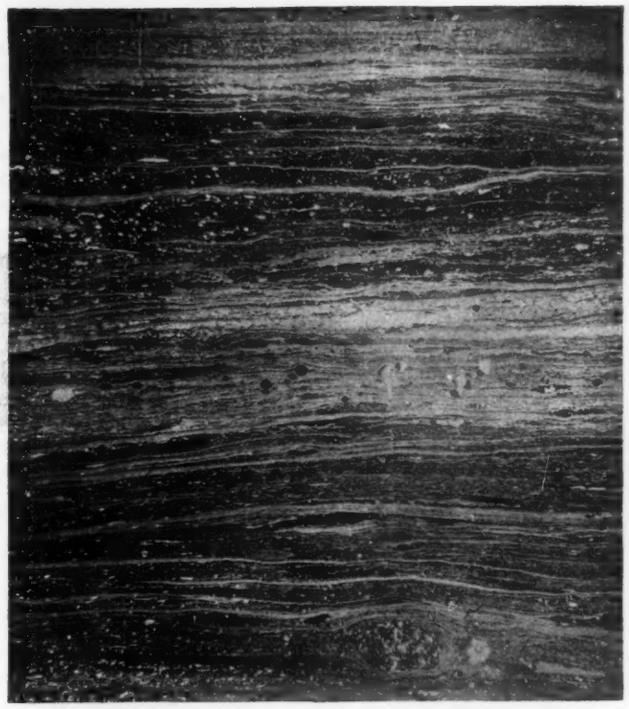


FIG. 4. DULL COAL FROM PITTSBURGH SEAM

Photographed by transmitted light at a low magnification. The narrow lighter bands represent thin strips of anthraxylon, or bright coal; the darker, mottled bands between them represent the attritus, showing that the dull coal is compiled of alternate layers of anthraxylon and attritus. Magnification 10.

They are in the very tissues where they would be expected were the tree still living. In the attritus of the lignites it is not quite so easy to determine the origin of all resinous constituents. Most of them, however, can clearly be traced to their sources without doubt; others are not so clearly defined and their origin is doubtful.

The resin inclusions found in the anthraxylon of the

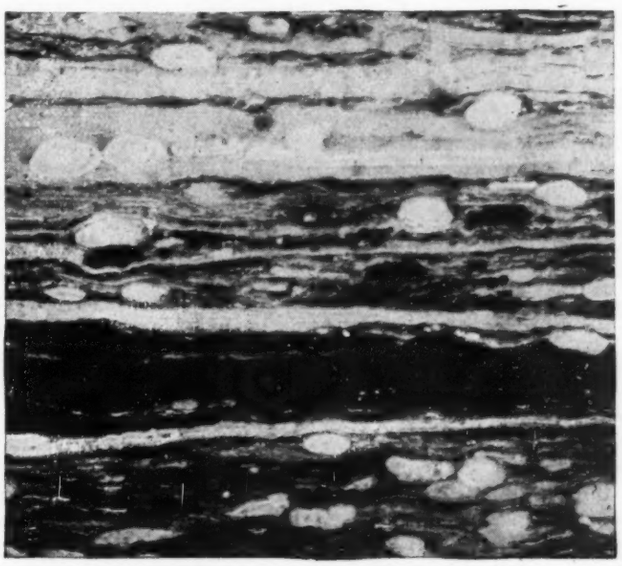


FIG. 5. THIN SECTION OF PITTSBURGH COAL

Resinous matter is clearly in evidence. The magnification employed in this case is 200 diameters.

lignites are highly concentrated. The largest proportion of resin in the stems of certain living pines is about 12 per cent of the dry weight. In the lignites sample after sample of anthraxylon, shown to be part of a tree trunk, is found where the resin content is far above 12 per cent—in many pieces it is close to 50 per cent. Though the wood decayed and largely disappeared its resin remained and thus was concentrated. The sub-bituminous coals are similar to the lignites in every respect in regard to their resinous content.

In the bituminous coals also resinous bodies are found both in the anthraxylon and the attritus. An examination of the anthraxylon shows that they are held in the tissues and in the cells where they might be expected to occur were the tissues living (Fig. 4). It is fair to assume, therefore, that the resins found in coal are the resins natural to the plants of which the coal is composed. In some cases such resinous bodies form a considerable part of the coal.

FIG. 6. PITTSBURGH COAL SECTION

Highly magnified to show in detail the character of the spore-exines and that of other constituents of the coal body. Magnification 1,000.

White, after a number of years of experience and study of fossil plants, concludes that the plants of the Carboniferous period contained as much resinous matter as the plants of the later ages. He further concludes that the amount of the wood found in the Paleozoic coals containing resin justifies the conclusion that the quantity of resin contributed by the coal-forming plants and preserved either in place in the wood or as accumulations in various layers of the coal may have been as great in the Paleozoic as in later periods.

### Coal Resins May Yet Serve as Varnishes

There also are invariably scattered through the attritus of all bituminous coals bodies of a resinous appearance, usually of a rounded to oval shape but also of cylindrical and irregular shapes (Fig. 5). A good many of these can directly be traced to be of the same origin as those in the anthraxylon; others are inferred by analogy and through their similarity to those in lignite to be derived from the natural resins; regarding others it is not safe to venture any conclusion. On the whole it is quite safe to say that they are derived from plant substances similar to the plant resins of today.

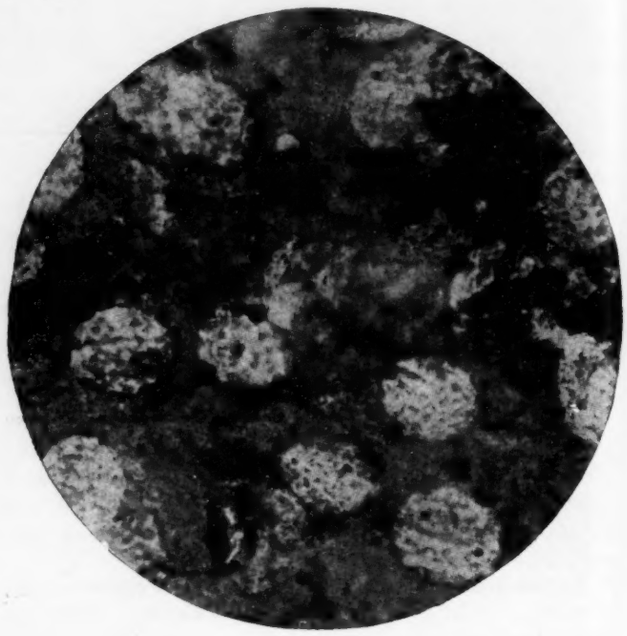


FIG. 7. THE BROAD SIDES OF SPORE-EXINES

Horizontal section of Pittsburgh coal at the high magnification of 1,000 diameters.

The fossil resins, whether found in lignite and coal or in the ground, like amber, fishtelite and succinite, are among the most stable substances known. It took the best chemists years of work to find the composition of fishtelite, for example, on account of its resistant nature. It is, therefore, little wonder that the chemistry of coal is so difficult. In view of this fact, if certain constituents of coal, like the resins, could be

FIG. 8. NOTE SMOOTH OUTLINE OF SPORE-EXINES

Part of a thin section of the Pittsburgh seam at a high magnification, showing the constituents in detail. Magnification 1,000.

isolated and dissolved, they should yield durable commodities like lacs and varnishes.

On account of their beautiful colors and brilliant appearance under the microscope the spores were the first objects discovered in coal. Since their discovery they have often usurped a place as the main objects of investigation, the main subject under discussion being put in the background or left out altogether. More prominence and more importance has therefore been placed on them than they deserve. It must, however, not be construed that they do not form important constituents in all the coals.

The spores and pollen grains are found only in the attritus of coals, usually mixed with the other constituents (Figs. 1, 2, 3, 6, 7 and 8), but here and there they are found in mats. Frequently they are in lumps still held together the way they grew in the plant. Before it was known what they really were, various names were given to such lumps. Occasionally whole cones of the coal-forming plants remained in the coal with all the spores intact.

### Spore Cases and Pollen Cases Most Durable

The spore content of coal may vary greatly in the same bed from place to place, from top to bottom and also from seam to seam. When spores form a considerable part or a large proportion of a coal bed or a part of a layer of a coal bed they lend distinctive characters to it.

The important part of the spores in coal formation are their outer walls or exines. In the peat stage the inner or living parts were soon destroyed. But the outer walls or exines are highly resistant to bacterial activities and chemical reagents and have thus escaped decay and disintegration to a large extent. In this respect the spore-exines of all the spore-bearing plants

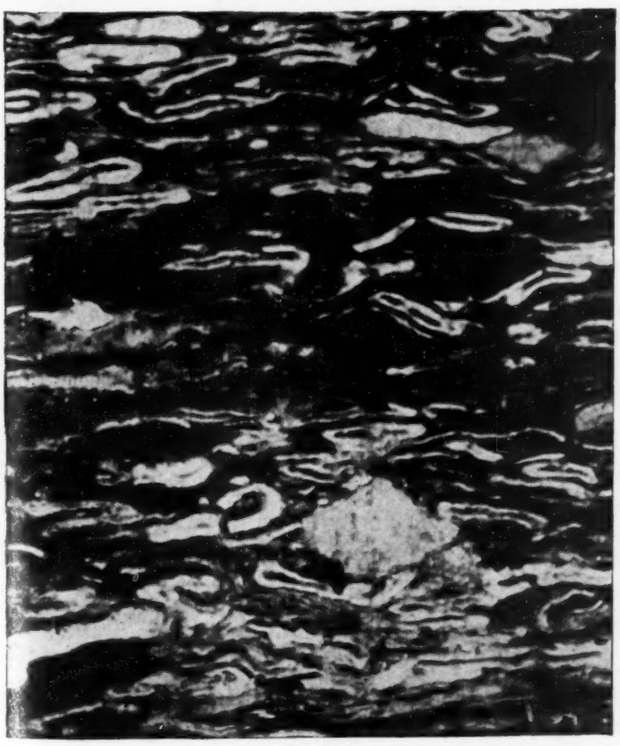


FIG. 9. MUCH SPORE MATTER IN BONE COAL

Thin vertical section of bone coal, showing that it is largely composed of spore matter. Most cannel coals present a similar appearance. Magnification 200.

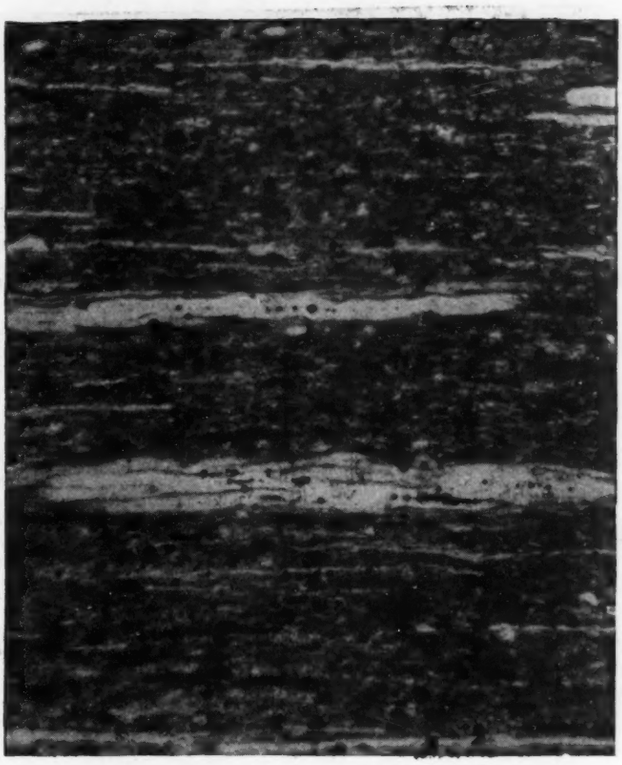


FIG. 10. OIL SHALES CONTAIN SPORE-EXINES

Thin cross-section of oil shale or chocolate shale from the Devonian of Illinois. The lighter bands are recognizable spore-exines, the black mottlings represent pyrite particles. Magnification 200.

are alike, as are also the exines of pollen grains of the seed plants.

In the living plants they are composed chiefly of oils, waxes, fatty acids, alcohols, some resinous matters and cellulose. Langer found in the spores of a club-moss 49.3 per cent oil. Besides this they contained phitosterine, benzol derivatives, and acid called pollin, and cutin.

When the attritus forms a relatively thick layer in a seam, say half an inch or an inch or more in thickness, and is composed largely of spores it is called horne coal (Fig. 9). When such a layer is still thicker, so that it forms a considerable part of the bank or forms a bed by itself, it is called cannel coal.

### Oil Shales Are Clays with Attritus

In other words cannel coal is an attritus in which spore matter forms the predominant part. Some cannel coals contain little else than spore matter. Others contain varying quantities of other plant-degradation matter. The ash content usually is high in such coals. There is no distinction between cannel coal, boghead coal, torbanite and torbane mineral. Spores form by far the largest part of the organic matter in all of them.

A layer of attritus, having much mineral matter, or ash, mixed with the spores and other organic materials of which it is formed, if of such thickness as to be noticeable, is called bone coal. When it is composed still more largely of mineral matter it becomes carbonaceous shale.

When a layer of attritus in a coal seam is so rich in clay that the latter is the predominant constituent it is called carbonaceous shale. Such shales often form beds by themselves and are occasionally of considerable thickness and extent. They are found all over the world

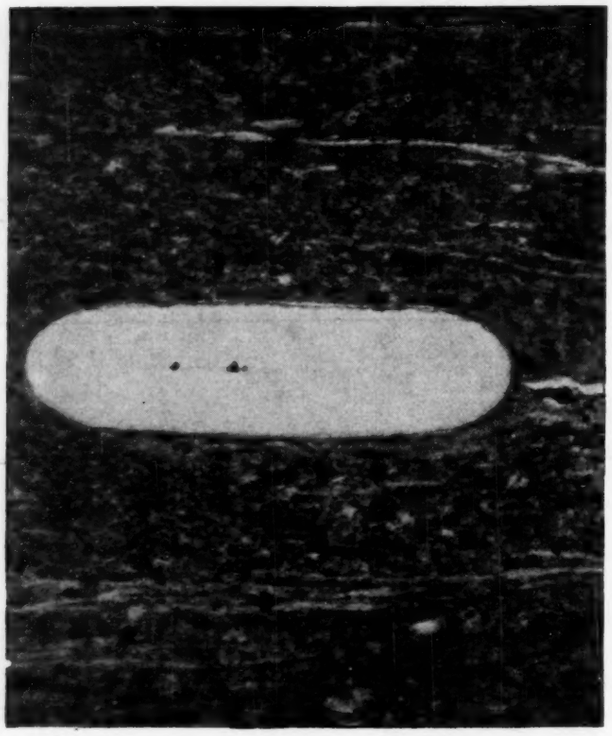


FIG. 11. LARGE SPORE IN ILLINOIS SHALE

Thin cross-section of oil or chocolate shale from the Devonian of Illinois. The large spore-exine is Dawson's *Sporengites Huronensis*. Magnification 200.

and are generally called black or carbonaceous shales.

When such deposits or rocks are so rich in organic matter that when subjected to distillation they yield oils, they are called oil shales (Figs. 10 and 11). Microscopic examination shows that the oil does not exist in the shale as such, but is generated from the organic residue, or attritus, in the shale when heated. Because the organic remains yield oil on distillation they are now generally called "kerogens," from the Greek "keros," meaning wax, and "genesis," birth.

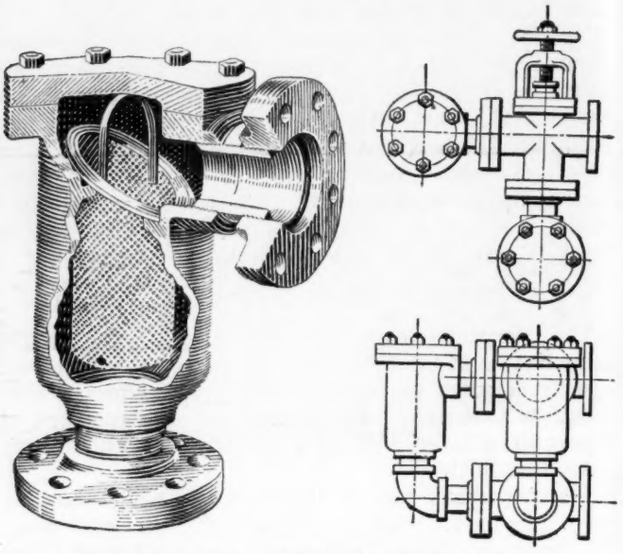
The kerogens, however, are nothing more or less than the remaining parts of plants, residues of plant matter, or plant-degradation matters. Spore remains predominate in the organic matter of those that have been examined. In the oil shales of the Devonian from Illinois, Indiana, Kentucky, Ohio and Tennessee the organic matter consists almost entirely of the remains of spores, intimately mixed with a fine clay. More or less pyritic matter and a few sand grains also are distributed through the mass. The spores are of the ordinary fern type prevalent in coals of the Carboniferous age, and present the same general appearance.

The deposits evidently were formed over a very large area, which must have been a plain with very poor drainage and for the most time covered with a shallow sheet of water. The basin was the habitat of aquatic and semi-aquatic plants related to the coal-forming plants of the Carboniferous era. As happens in such present-day habitats, the main plant parts largely decayed and disappeared, the most resistant parts, the spore-walls, remaining and forming a deposit with the mineral matter of the plants, and with that carried in by wind and perhaps water. It is probable that spores form the larger part of the organic matter of all oil shales and that the spores are the source of the oils distilled from them.

## Strainers to Remove Solid Foreign Matter

FOR the removal of the solid foreign material in suspension strainers are required on suction and discharge lines of lubricating-oil, fuel-oil and quenching-oil systems. Also power plants which obtain their raw-water supply from such sources as rivers, streams or lakes require strainers to prevent weeds, sticks, marine plants and small fish from entering the system.

For this purpose the Griscom-Russell Co., 90 West St., New York, has placed on the market the G-R



STRAINER FOR CLEANSING WATER AND OIL

In almost any liquid matters are bound to be found, making straining necessary. As these impurities clog the screens, a large screening area must be provided if the intake of liquid is not to be impeded.

strainer, as shown in accompanying illustration. The body is constructed of cast iron and the strainer basket of perforated sheet steel, which is lined with wire mesh whenever the strainer is to be used on an oil line.

This strainer is of the single type and may be installed either as a single unit or as a strainer set. The latter consists of two of these strainers connected complete, including two three-way valves and necessary connecting elbows, unions and nipples. The use of a set permits the cleaning of either of the two units without interruption of service.

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THE HOUSE COMMITTEE ON WAYS AND MEANS will conduct hearings on tariff revision beginning Jan. 6 and terminating Feb. 16. The free list, which includes coal, will be considered Feb. 11, 12 and 14. Interested parties should request assignment of time for hearing by direct communication to the clerk of the committee.

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THE NUMBER OF CARS loaded with revenue freight on the railroads of the United States during the week ending Nov. 20, according to the car service division of the American Railway Association, was 880,928, or 26,000 more than were loaded during the corresponding week of 1919 and 23,000 more than during the corresponding week of 1918. The number of cars loaded, however, was 39,000 less than during the preceding week. While there was a considerable decrease in the volume of freight traffic which the railroads were called upon to handle in November, as compared with the record month of October, car loading has continued to exceed that for the corresponding period of the last two years, as it has since the first week of August. A reduction in the amount of traffic is seasonable for November and December.

# What Type of Mine Pump Shall I Specify?*

## Two General Varieties of Pump, Positive-Acting and Centrifugal, Are Employed in Coal Mines—The First Should Be Used Where the Quantity of Water To Be Handled and the Head Are Small and the Second Where the Quantity and Head Are Large

BY JOHN W. HALLOCK†
Pittsburgh, Pa.

TO SOME USERS of pumps it never occurs that there may be a certain particular type of machine that will best suit their conditions. To them a pump is a pump, and under such circumstances price is usually the determining factor when a choice must be made. They are somewhat like the man who wrote a manufacturer in regard to a hydraulic ram. His letter asked that he be sent a catalog showing "male water sheep."

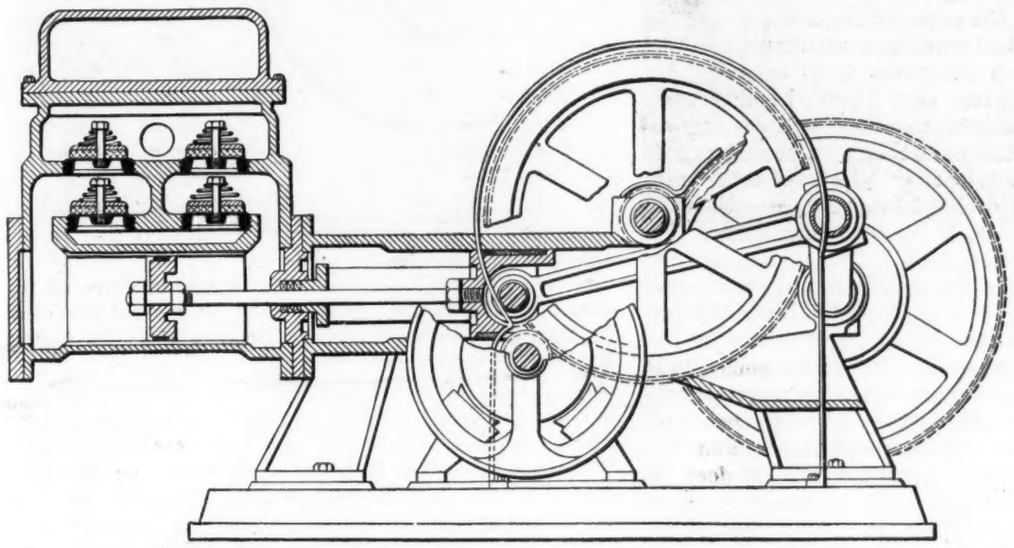

FIG. 1

**Positive-Acting Pump**

The upper valves are for the discharge and the lower valves for the suction. The actuating motor can be seen on the bedplate between the standards which support the pump and gears.

It will not be necessary to state here that the type of pump used may mean all the difference between success and failure in a mine drainage system. Failure may entail the loss of much time in operation with its resulting economic disadvantage, to say nothing of possible sacrifice of life. It is important, therefore, that the right type of machine be installed—more important, I believe, in the case of mine pumps than in that of any other type of equipment.

Pumping manufacturers and jobbers today realize this as never before. In fact, I believe this to a large degree explains why pumps are now being handled through a sales agency rather than direct from the factory. The sales agency is in far more intimate contact with operating officials in the coal fields than any factory salesman possibly could be. Its force also is familiar with any particular or peculiar local conditions which may govern pump selection or use. Lastly, the pump user may have the benefit of large local stocks of repair parts at the headquarters of the agency.

The time arrived long since when those who have anything whatever to sell—be it pins, needles, mining machinery or automobiles—have seen that what must be sold is not as large a bill of goods as possible but exactly the equipment that the purchaser needs, and that only. True, it is often necessary to recommend to a prospective buyer that he purchase equipment more extensive and costly than he at first deemed necessary. More often, however, it is possible to show the prospect an actual ultimate saving, obtained either through higher efficiency or a rearrangement of present equipment that will effect an economy of one kind or another. Realizing that this is or should be the usual state of affairs today, we are forced to the conclusion that most representatives of factories and sales agents are highly trained specialists in their line. No longer are they mere "order chasers." They are men whose success or failure depends on their ability to serve their customers, and through them society in general.

Admitting then that the pump salesman comes to the operator as a trained specialist in his line, why should any mine official equip himself with a knowledge of the principles underlying pump selection? Why not leave all this to the salesman? The answer is obvious: Operating men are paid by their employers for the service they render. They can give greater service by buying or specifying the right kind of equipment for use in their employer's plant than the wrong kind, and they can be sure of obtaining the best equipment only by specifying the right kind of machines.

Neglecting, for the present, the matter of price, two variables, chief of many affecting the type of pump to specify, exist. These are the quantity of water per minute or per hour to be handled by the pump and the total head against which the machine is to operate.

*Abstract of paper entitled "The Type of Pump to Specify," presented before the Mine Electricians and Mechanics' Institute, Charleston, W. Va.

†Professor and head of the department of industrial engineering, University of Pittsburgh.

Of course, others are present, such as the degree of acidity of the water, for example, but these two are the most important and will be considered first.

The capacity of any pump is usually specified as being so many gallons per minute. Thus for gathering purposes, pumps of standard makes are built in 30,- 50,- 75,- 100- and even 200-gal.-per-minute capacities. How fast the pump shall run to produce this capacity is a matter resting with the manufacturer. He designs his pump so that piston and gear speeds, bearing pressures and water velocities may lie within the limits that past experience have shown to be most advantageous.

### Capacity Not Determined Solely by Size

Never ask for a price on a "3-in. pump," for the expression means next to nothing. It might signify a piston pump having a 3-in. discharge connection or a 3-in. diameter piston, or it might mean a centrifugal pump having 3-in. connections. Obviously, the expression gives no idea as to the capacity required.

Second of the principal variables mentioned is the total head against which the pump is to operate. In naming this figure too great care cannot be exercised. The importance of absolute accuracy will be shown later. Let us now confine ourselves to a consideration of what makes up this total head. First, the total head consists of three kinds of head or pressure acting on the pump, namely, the static, or standing, head; the friction head, and the velocity head.

The static head is the difference in level between the water in the suction pit, or sump, and the highest point of discharge. It has no relation whatever to the length or size of discharge line or anything else except the vertical distance between the water surfaces mentioned. This, of course, includes the distance of suction as well as that of discharge, and right here let it be said that, all things else being equal, the suction head should be kept as low as possible. It should be kept down to 8 or 10 ft. if circumstances will permit, and a foot valve should be installed unless this is absolutely impossible.

The second element going to make up the total head is called the "frictional head." This is exactly what its name signifies. It is the additional pressure imposed on the pump because of the friction of the water against the walls of the pipe. This is, of course, greater in a small pipe than in a large one discharging the same quantity of water. Also in the same size of pipe, the larger the quantity of water, the greater the friction.

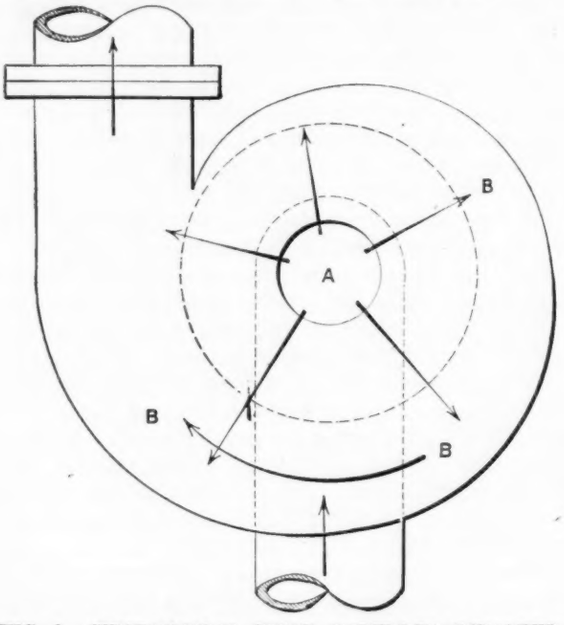


FIG. 2. CENTRIFUGAL PUMP, IMPELLER REMOVED

Water enters from the suction pipe at the eye or center (A) and flows radially to the volute (B) and thence up the discharge pipe. The flow of the water is marked by arrows.

Friction head usually is expressed as so many feet of water pressure per hundred feet of discharge pipe. This amount has been determined by actual experiment and long and accurate tables have been compiled and are embodied in various trade catalogs. Table I gives an idea of the way in which such tabulations are made. These tables are always based on the use of new, clean pipe. If the pipe is old, and consequently somewhat corroded inside, the friction will be greater. This added amount due to old pipe usually is taken care of by increasing the figures in the table by several per cent. For instance, in pipe that is extremely rough inside, the friction values may be taken as being 50 per cent greater than those shown. Elbows and fittings also increase the friction head. Table II is a characteristic tabulation giving friction in new, clean cast-iron elbows.

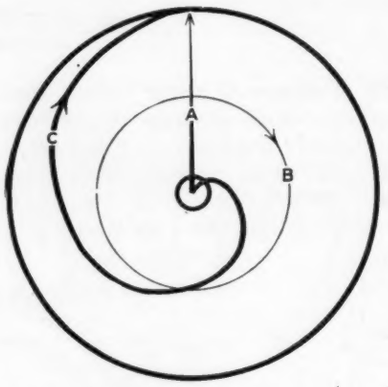


FIG. 3. MOVEMENT FROM FORCES IN TWO DIRECTIONS

The water has a centrifugal movement (A) and a revolving movement (B) which results in its taking a curved path (C), commencing at the eye and ending at the periphery of the wheel.

The last separate item going to make up the total head is known as the velocity head. This is the pressure imposed on the pump in starting a column of water from a state of rest and accelerating it to full velocity. It is similar to the big inrush of power on a motor when starting. This head usually is not accurately calculated for each specific case, but due allowance is made in design and specification to take care of this portion of the total head.

### Calculation of Total Head in Special Case

To illustrate the method followed in using the tables to determine the total head against which a pump is to operate let us assume the following data: Quantity of water to be handled, 200 gal. per minute; static head, 110 ft.; size of pipe line, 4-in. (new pipe); length of pipe line, 1,250 ft.; line contains ten 4-in. 90-deg. elbows.

Referring now to Table I, the friction of 200 gal. per minute through the 4-in. line is 3.12 ft. per 100 ft. length of pipe. Through 1,250 ft. the friction would therefore be $12\frac{1}{2} \times 3.12 = 39$ ft. Referring to Table II, the friction of 200 gal. per minute through one 4-in. 90-deg. elbow is 0.4 ft. The friction in ten elbows is therefore $10 \times 0.4 = 4$ ft. The velocity head in this case may be neglected and we may say that the total head is 110 ft. + 39 ft. + 4 = 153 ft. A pump would thus be required that would deliver 200 gal. per minute against a total head, including friction, of 153 ft. It is usual to specify total head, "including friction," so as to show that friction has been taken into account and that no further additions for length of line, size of pipe, or number of elbows are necessary.

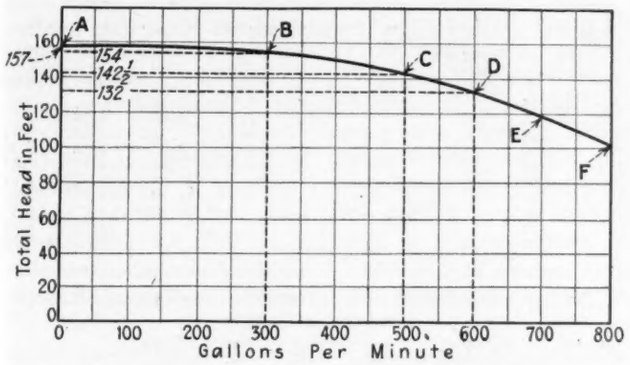


FIG. 4. HEAD-CAPACITY CURVE FOR CENTRIFUGAL PUMP
The gallons per minute are measured by running a horizontal line from the left vertical to the curve, and the head for that capacity is measured by running a vertical from the base line to the same point in curve.

Now, assuming that the number of gallons per minute, or the quantity of water to be handled by the pump as well as the total head against which the pump is to operate, can be accurately determined, how may the type of pump best adapted to the particular conditions at hand be selected? In approaching this question two broad rules may be laid down, which it will be understood are only general and, therefore, subject to change as other circumstances may require. These are:

(1) Use some form of a piston or plunger pump (in other words, a positive-acting type) where the quantity of water is relatively small and the head relatively high.

(2) Use a centrifugal pump where the quantity of water to be handled is relatively large, the total head comparatively low, or where both these conditions exist.

### Four Secondary Considerations in Ordering

Before proceeding to a discussion of these two general types of pumps—positive-action and centrifugal—the other conditions that may influence a choice should be explained. These conditions usually are four in number: (1) The amount of floor space and headroom available for installation; (2) the method of drive to be employed (that is, whether electric motor, steam or gas engine); (3) the degree to which safety of life and continuity of output depend on the constant operation of the pump, and (4) the allowable first cost of the installation.

As an example of the influence of these factors, consider the use of a gathering pump. Here the quantity of water usually is small (and likewise the head). Furthermore, the floor space and headroom required by a gathering pump of small capacity also are small. As a result the pump used is usually a positive-acting machine of the horizontal piston or plunger type.

On the other hand, for voiding water from a large sump served by several gathering pumps the quantity of water in gallons per minute to be handled is relatively large. The use of a positive-acting pump would entail a machine of large size, requiring considerable floor space and plenty of headroom. Here, therefore, is a place where a centrifugal pump requiring small floor space and low headroom may profitably be employed. The use of a centrifugal pump is further justified if an electric motor is to drive it, as a motor can be direct-connected to the pump and the use of belting or gears eliminated.

Bearing the above broad underlying principles in mind, we may now consider the two general types of pumps. A positive-acting pump is one in which a piston or plunger works directly against a portion of the water, forcing it to take a prearranged path through suction valves into the cylinder and thence through another set of valves into the discharge line. A sectional view of such a machine is shown in Fig. 1.

In this type of pump good practice permits a piston speed of not over 100 ft. per minute for continuous service. Therefore, as the piston must actually displace all of the water to be moved, it is readily seen that to handle large quantities per unit of time, either an excessively large piston or a number of pistons working simultaneously will be required.

Where the size of such a pump becomes prohibitive from the standpoint of first cost or the considerations of headroom and floor space, the centrifugal pump may be properly considered. There have been so many ill-advised installations of centrifugal pumps and so many cases of the failure of such machines to come up to the expectations of users that I believe a brief explanation of their operation will be helpful.

### Some Consideration of Centrifugal Pumps

First, consider Fig. 2. This is a diagrammatic sketch of a centrifugal pump or shell with suction and discharge piping but with impeller or rotating element removed. Now suppose water is caused to flow up the suction piping. This water would enter the casing at the eye or center (*A*) and flow radially from there to the volute (*B*), and thence up the discharge pipe. It is seen, therefore, that if energy could be exerted on the water in the pump instead of from the outside, as assumed above, and the water caused to flow radially within the casing, it would move through the piping in the same manner and direction as above described.

Now the only means available whereby the water may be moved radially in the casing is by a rotating or revolving motion. This does not give a true radial flow. Instead, such a rotating action gives two distinct motions to the water, a radial motion and a whirling or rotary motion. These two movements take place at one and the same time and the result, or the resultant effect, is a curved path from the eye to the periphery of the wheel. Referring to Fig. 3, *A* represents the radial motion or that in the direction of the radius of the impeller or rotating element; *B* represents the whirling motion given to the water by the wheel.

As these two motions take place simultaneously, the result is a movement in the general direction shown in line *C*. After leaving the impeller in the direction shown by line *C*, the water is guided by the shape of the casing or shell into the discharge pipe. By having

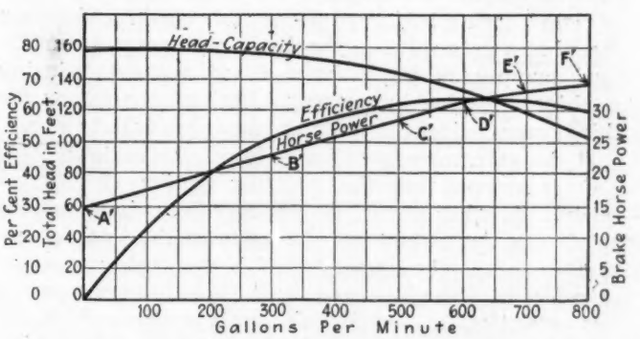


FIG. 5. HEAD-CAPACITY, EFFICIENCY AND HORSE-POWER CURVES
This pump makes the most efficient use of the power supplied it when pumping about 650 gal. per min., when the brake horsepower is roughly 32, the efficiency 62 and the head about 125 ft.

a number of blades in the impeller and keeping this element revolving at a constant speed, water is made to flow continuously up the suction pipe to the casing, then out of the casing into the discharge line. Thus the water is brought from a state of rest in the sump through the suction pipe at low velocity up to the eye of the impeller. Here the velocity increases steadily to a maximum at the tip of the impeller blades. Between the impeller tip and the discharge openings this high velocity is transformed to pressure. This transformation must be gradual and uniform, as a quick change means the introduction of shock with consequent loss of efficiency.

### Calculating Required Speed of Impeller

To illustrate briefly the method used to arrive at some of the details of correct centrifugal pump design, refer again to Fig. 2. Suppose the discharge pipe to be 50 ft. long and vertical. A study of mechanics shows that a particle falling through any distance ($h$) will attain a velocity after traversing this distance equal to $\sqrt{2\ gh}$ where $g$ is the acceleration due to gravity and is equal to about 32.2. Then if we consider a particle of water falling down the discharge pipe, it would attain a velocity by the time it has traversed the 50 ft. of $\sqrt{2 \times 32.2 \times 50}$ = about 56½ ft., or 678 in., per second.

In order to balance the falling particle of water, any other particle on the rim of the impeller would have to be moving at the same velocity. Suppose the impeller is 11 in. in diameter, or about 34½ in. in circumference. In order, therefore, to move 56½ ft., or 678 in., per second, the impeller would have to travel 678 ÷ 34½ or nearly 20 revolutions per second or 1,200 r.p.m.

By following quite similar lines of reasoning other important figures in the design are calculated. The sectional area of different points in the casing and impeller, throat area, etc., must all be carefully designed in order to produce an efficient pump. The methods followed in arriving at these figures in the design are not of interest here, and their further consideration, therefore, will be omitted. The actual behavior of centrifugal pumps in service is important, however, and accordingly, the few facts in which users of this class of equipment are most vitally interested will be briefly considered.

It is a well-known fact that if no foot valve is used on the suction of a centrifugal pump, the water can flow easily down the discharge pipe through the pump casing and impeller and back into the suction pit, or sump. This is evident because no valves are present to retard such a backward flow. It is also a well-known fact that a gate valve in the discharge line of a centrifugal pump may be entirely closed without injuring machine or piping in any way. Perhaps the reason for this is more evident if reference is made again to Fig. 3.

If the gate valve is entirely closed, the radial motion ($A$) is stopped but the whirling motion ($B$) is retained. In other words, the impeller then simply whirls or churns the water. If the valve in the line is only partly closed, the quantity of water being pumped is reduced. Thus by changing the relation between the two velocities ($A$ and $B$), the head against which the pump may be used is varied. In fact by partly closing such a gate valve, the head against which the pump operates is altered, for the head is governed by the amount of the friction imposed by the valve itself. This

TABLE I. LOSS OF HEAD IN FEET PER 100 FT. OF PIPE LENGTH

| Quantity of Water in Gallons per Minute | Sizes of Pipe | | | | | |
|---|---|---|---|---|---|---|
| | 1 in. | 1½ in. | 2 in. | 3 in. | 4 in. | 5 in. |
| 25 | 45.5 | 5.60 | 1.96 | 0.27 | .... | .... |
| 50 | .... | 20.2 | 7.10 | 0.98 | 0.24 | .... |
| 75 | .... | 42.7 | 14.9 | 2.11 | 0.52 | 0.16 |
| 100 | .... | 73.0 | 25.6 | 3.52 | 0.88 | 0.29 |
| 150 | .... | .... | 54.0 | 7.72 | 1.82 | 0.63 |
| 200 | .... | .... | .... | 12.80 | 3.12 | 1.06 |
| 250 | .... | .... | .... | 19.70 | 4.80 | 1.60 |
| 300 | .... | .... | .... | 27.10 | 6.70 | 2.25 |
| 400 | .... | .... | .... | .... | 11.30 | 3.81 |
| 500 | .... | .... | .... | .... | 17.20 | 5.80 |

TABLE II. FRICTIONAL LOSS IN FEET FOR VARIOUS SIZES OF 90 DEG. ELBOWS

| Quantity of Water in Gallons per Minute | Sizes of Elbows | | | | | |
|---|---|---|---|---|---|---|
| | 1 in. | 1½ in. | 2 in. | 3 in. | 4 in. | 5 in. |
| 25 | 1.35 | 0.25 | 0.09 | ..... | ..... | .... |
| 50 | .... | 0.99 | 0.35 | 0.08 | ..... | .... |
| 75 | .... | 2.0 | 0.75 | 0.20 | 0.05 | .... |
| 100 | .... | .... | 1.41 | 0.29 | 0.10 | .... |
| 150 | .... | .... | 3.20 | 0.66 | 0.22 | 0.09 |
| 200 | .... | .... | .... | 1.18 | 0.40 | 0.16 |
| 250 | .... | .... | .... | 1.84 | 0.62 | 0.25 |
| 300 | .... | .... | .... | 2.63 | 0.89 | 0.36 |
| 350 | .... | .... | .... | .... | 1.24 | 0.50 |
| 400 | .... | .... | .... | .... | 1.59 | 0.63 |
| 500 | .... | .... | .... | .... | 2.47 | 1.01 |

principle is utilized in plotting curves showing exactly what a given centrifugal pump may be expected to do.

To illustrate the plotting of what is known as the head-capacity curve, suppose a pump is mounted with a gate valve in the discharge line, a pressure gage at the discharge of the pump and a means of measuring the quantity of water discharge per minute by the machine. (For all ordinary sizes of pumps, a barrel or tank of known capacity may be used for this latter purpose. The discharge piping is so arranged that it may be swung so as to discharge into the barrel or tank, and the time required to fill the receptacle measured by a stop watch.)

Now if the gate valve be fully closed no flow will take place, but we will suppose that the pressure gage reads 68 lb. Now, as is well known, 1 lb. of pressure per square inch is equivalent to a head of about 2.3 ft. of water. Hence, 68 lb. is equivalent to 157 ft. of head. Suppose then that, as in Fig. 4, two lines are laid off at right angles to each other, one vertical and one horizontal, intersecting at 0. Now if distances on the horizontal line represent quantities of water in gallons per minute and vertical distances, on the other line, represent feet of head, it is evident that the point just found by test will be located at $A$.

Again, suppose the gate is opened slightly to allow a little water to flow, and it is found that the pump is delivering water at the rate of 300 gal. per minute, but that the pressure has dropped to 67 lb., equivalent to a head of 154 ft. This gives the point $B$ on our plot.

Opening the gate valve still further might show that the pump delivers 500 gal. per minute against 61 lb. pressure (142½ ft.). This gives the point $C$.

Similarly, points $D$, $E$ and $F$ might be located. Now if a smooth curve be drawn through all of these points, the head-capacity curve for that particular pump running at that certain speed will result. From this curve may be read the relation between head and capacity at any point.

Now if the power actually required to drive the pump at each of the points mentioned is measured (this can be done by means of a voltmeter and ammeter or by a wattmeter if the pump is directly connected to a motor) other points—$A'$, $B'$, $C'$, etc., in Fig. 5—may be obtained. This also gives a smooth curve known as the horsepower-capacity curve.

By a little calculation, remembering that the efficiency of a unit of this kind is the ratio of the output to the power input, on top of the two curves already found, may be plotted the capacity-efficiency curve, shown also in Fig. 5. These three curves then show all of the operating characteristics of the particular pump under consideration. In buying a centrifugal pump the purchaser should be furnished with such a set of curves. It will then be possible for him or his engineers to judge, at least in a general way, whether this pump may be used in another place where the head will be slightly different.

Reference was made above to the fact that in plotting these curves, the speed of rotation of the impeller must be kept constant. If the speed is lowered, the position of the head-capacity curve also is lowered. For instance, if the curves in Figs. 4 and 5 were plotted at 1,700 r.p.m., the corresponding curve for 1,450 r.p.m. would have the same general shape, but would be lower. The horsepower curve also would be lower, while the efficiency curve would be moved slightly to the left.

Before leaving the subject of centrifugal pumps the matter of keeping such machines up to speed must be emphasized. If such a pump is directly connected to a 250-volt motor and the voltage drops to 160, the speed will decrease to about three-fifths of normal. This will cause a serious drop in the volume of water discharged and may even cause the machine to stop pumping altogether.

A multi-stage centrifugal pump is similar in action to a single stage. Each of the lower stages discharges into the suction of the next succeeding stage, each adds to the pressure of the water, and hence to the total head against which the machine may be used.

There is no definite dividing line between the conditions which call for a positive-acting pump and those which permit the use of a centrifugal. This is largely a matter of judgment based on experience and data as to cost, power available, power expenses, etc. And here again it should be repeated that the pump salesman who serves most by selling the types of pump best adapted to particular existing conditions is the man who judges most accurately along the lines indicated.

This has necessarily been a quite general presentation of the subject in hand. It is hoped that the basic principles cited will be helpful to those having a pumping problem to solve. It should be understood, however, that peculiar local conditions may to a marked degree further influence the type of pump to specify.

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IN HIS ANNUAL REPORT, issued Dec. 14, Secretary of Commerce Alexander refers to the work of the Bureau of Foreign and Domestic Commerce in developing American trade abroad. He says that through the assistance of the commercial attaché's office at Rome the Societa Angelo Romana bought $200,000 worth of American coal, and the Trade Commissioner at Brussels placed Belgian manufacturers' groups in touch with American interests prepared to furnish raw materials and fuel in return for finished products to be sold in export markets.

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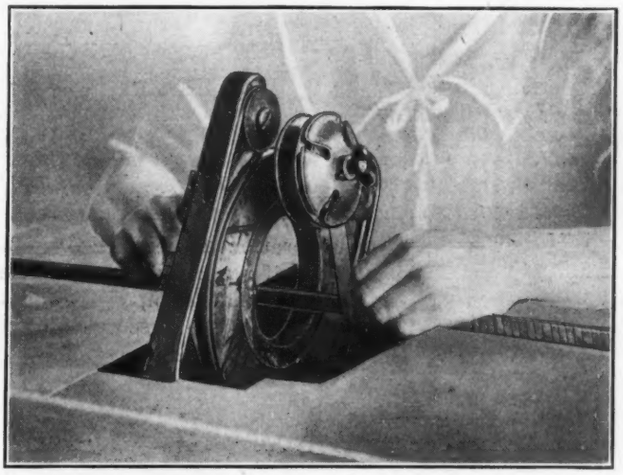
W. F. MCKENNEY HAS BEEN appointed to assist F. G. Tryon in the gathering of coal statistics for the U. S. Geological Survey. Mr. McKenney has been doing field work for the Bureau of Labor Statistics of the Department of Labor for the last three years. Prior to his service with the Department of Labor, he was librarian at the United States Naval Academy. Mr. McKenney is a native of Gloucester, Mass.

## Right Tapes to Use for Special Purposes

TAPES of various kinds have long been used for insulation purposes. This is because of the ease with which they can be applied to the irregular shapes of coils, cores, etc., upon which it would be difficult to place insulation in sheet form. Such tapes are either woven from fibrous materials—in which case they are known as stays or webbings—or they are cut from treated or untreated fabrics.

The General Electric Co. will soon place on the market a complete line of such tapes, including several



TAPING A CONDUCTOR WITH A WINDING MACHINE
Note the conductor, already wound, on the right side of the picture and the manner in which the tape is fed from a reel which gives it the right tension.

varieties cut from black or yellow varnished or oiled cloth. They will be adaptable for winding armature or field coils, transformer coils, etc.

Ordinary white cotton tape has selvaged edges, an open structure, smooth surface and medium strength It may be used to tape armature coils to form a basis for varnish. Asbestos tape contains a small percentage of cotton to facilitate the spinning of the yarn and is adaptable for use on windings where heat-enduring insulation is required.

Another class of these insulators is known as friction or splicing tape, such as is commonly used when splicing or connecting conductors, to cover joints that otherwise would be exposed. One type, known as splicing gum, is an all-rubber compound containing no cloth and made from fine Para rubber. At ordinary temperatures the heat of the hand is sufficient to cause the tape to unite, forming a solid, watertight joint. Gum-faced tape is made of a layer of 98-per cent pure rubber on a backing of unvulcanized high-grade rubber compound containing only fine Para. It is valuable for taping joints on underground rubber-covered cables or other places where high insulation and water proofness are necessary. Joints made from this tape may be vulcanized if desired.

Temporary binding or friction tapes are made of an unbleached cotton cloth, coated and filled with either black asphalt or rubber compounds. They are slightly adhesive at normal temperatures and form excellent temporary bindings for ordinary purposes.

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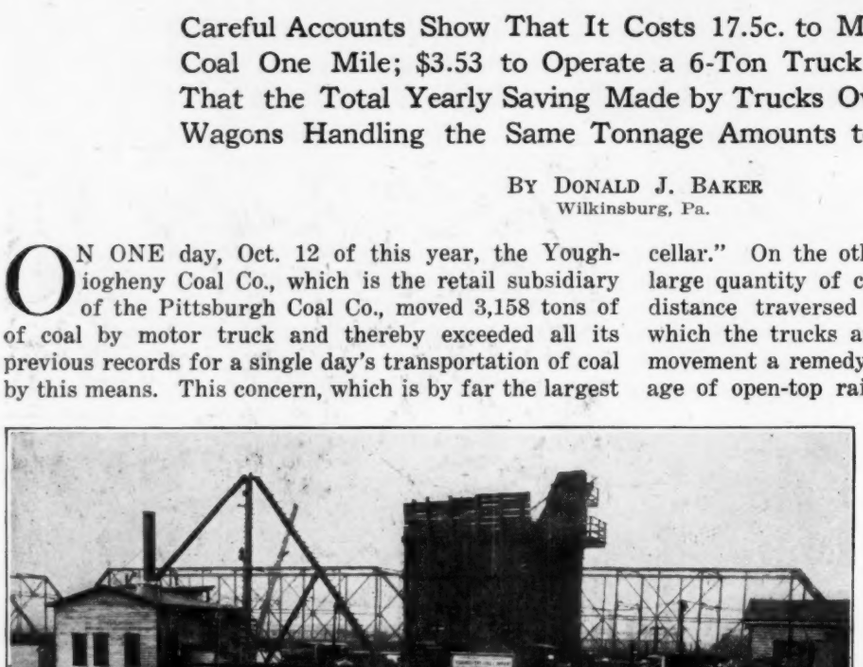
THE FUEL SUPPLY of the world was discussed before the meeting of the American Society of Chemical Engineers in Washington, D. C., by Prof. L. P. Breckenridge, of Yale. He urged fuel conservation.

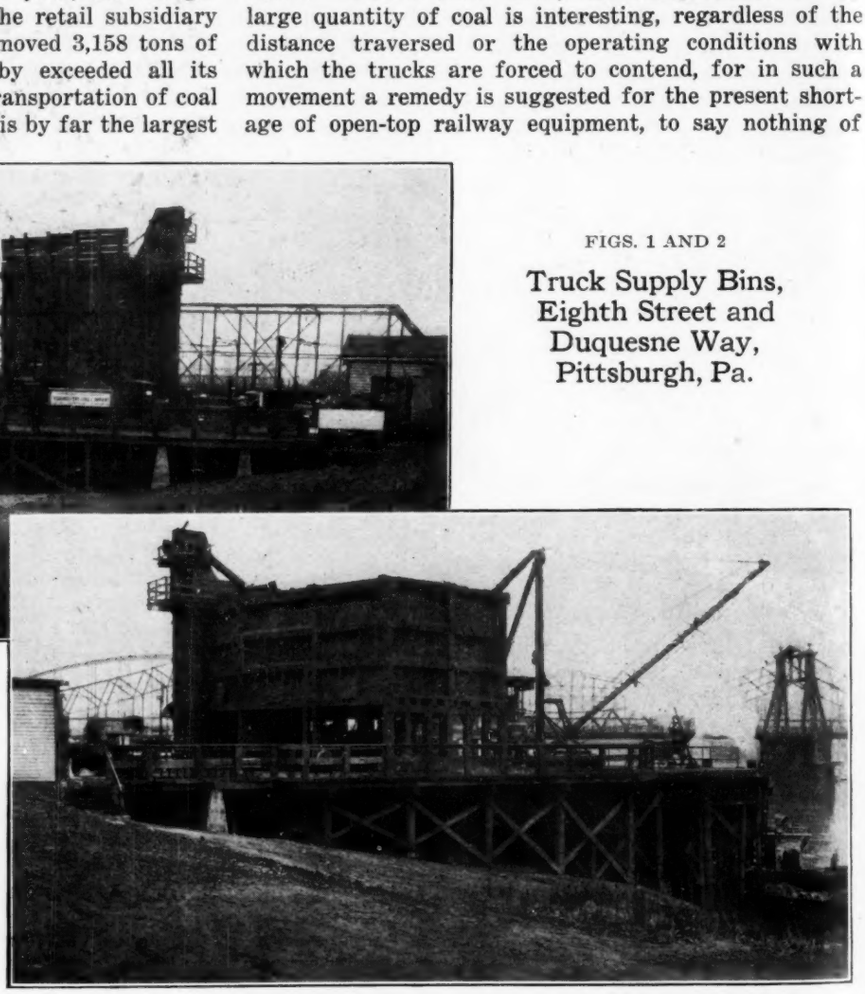
# Youghiogheny Coal Co. Delivers 60,000 Tons Monthly by Motor Trucks

## Careful Accounts Show That It Costs 17.5c. to Move One Ton of Coal One Mile; $3.53 to Operate a 6-Ton Truck One Hour, and That the Total Yearly Saving Made by Trucks Over Horse-Drawn Wagons Handling the Same Tonnage Amounts to About $43,000

By Donald J. Baker
Wilkinsburg, Pa.

ON ONE day, Oct. 12 of this year, the Youghiogheny Coal Co., which is the retail subsidiary of the Pittsburgh Coal Co., moved 3,158 tons of of coal by motor truck and thereby exceeded all its previous records for a single day's transportation of coal by this means. This concern, which is by far the largest retail dealer in the Pittsburgh district, moves over 60,000 tons of coal monthly by motor truck.





FIGS. 1 AND 2

Truck Supply Bins, Eighth Street and Duquesne Way, Pittsburgh, Pa.

Coal is unloaded from barges by means of a crane and grab bucket and is discharged into the open-top bins. This is one of six truck supply stations maintained by the Youghiogheny company.

Certainly this is a notable achievement and one particularly worthy of publicity at the present time. It is true that this tonnage was transported over relatively short distances, as is all the coal sold by the Youghiogheny firm, for the company caters exclusively to the retail trade and the major portion of its business is supplying with fuel the large office buildings and hotels of downtown Pittsburgh.

Undoubtedly the coal-producing industry as a whole would register a much keener interest in the feat just noted if the subsidiary of the Pittsburgh Coal Co. had moved this immense tonnage directly from "mine to cellar." On the other hand, the transportation of any large quantity of coal is interesting, regardless of the distance traversed or the operating conditions with which the trucks are forced to contend, for in such a movement a remedy is suggested for the present shortage of open-top railway equipment, to say nothing of the possibility of circumventing the recent advances in freight rates. Little wonder that nearly every operator is interested in learning more regarding the transportation of coal by gasoline power. Many sense the possibility that trucks will be applicable to their own individual needs, and that the truck may ultimately be the means by which their mines may be kept in full operation throughout the year.

Coal sold to retail consumers in the Pittsburgh district by the Youghiogheny company is supplied by the parent concern from its mines, all of which with two exceptions front on the Monongahela River. Six supply stations for loading trucks are maintained, all of which lie near the heart of Pittsburgh's business section. One

is located in the "South Side." This station is supplied from the Fair Haven mine of the Pittsburgh Coal Co., which dumps coal directly from mine cars into storage bins. Another is situated on the Baltimore & Ohio R.R. and is built so that the bins supplying the trucks may be filled by dropping the bottom gates of railroad cars that have been loaded at tipples of the company's mines on the outskirts of the city proper.

Of the four remaining stations or supply bins, three front on the Monongahela River and one on the Allegheny. The bins forming the loading station on the Allegheny water front, located at 8th Street and Duquesne Way, near the Eighth Street Bridge, are by far the largest of the six, mainly because they are located near the heaviest consumers. The coal, however, for the maintenance of all four stations is floated down the Monongahela River in barges. To supply the Allegheny river station the boats are moved down the Monongahela to its junction with the Allegheny and thence up the latter stream a distance of half a mile. At all four stations the barges are unloaded by steam crane and bucket; the tops of the bins, of course, being open.

### Large Consumers Served by Allegheny Dock

Fig. 1 is a view of the large bins that front on the Allegheny River, showing the shovel unloading barges. As was mentioned, this is the largest truck supply station of the Youghiogheny company. All the big business houses and hotels of downtown Pittsburgh are located less than half a mile from this point, so that the trucks in every instance are assured of minimum hauls.

As all the trucking stations are situated near the heaviest consumers, the movement of the trucks is short. In fact the length of the average round trip is well under a mile. Quite naturally the assertion will be made that moving coal directly from "mine to cellar" by auto truck over distances five, ten or even fifteen times as great as those traversed by this subsidiary of the Pittsburgh Coal Co. is an entirely different proposition. This is, of course, true.

Especially does the comparison seem less apt when it is remembered that the trucks in the one instance run over improved city streets; whereas those operating directly from the mine tipple would of necessity be forced to traverse macadam or even unsurfaced roads. The analogy, however, between the movement of coal "from barge to cellar" and "from mine to cellar" is a trifle closer than first impressions would seem to indicate.

### Difficulties in Operating City Trucks

Trucks operating wholly over busy, narrow streets in the downtown sections of a city the size of Pittsburgh are laboring under handicaps never encountered by similar vehicles on the unrestricted highways of the country. In the first place the grades of Pittsburgh's streets are heavy, and, by reason of the traffic regulations, it is impossible for the truck drivers to give their machines a running start before encountering the stiffer hills.

Secondly, the streets are extremely narrow; in the downtown section many of them are "one-way" thoroughfares only. Finally, the traffic rules are many and varied. While these, of course, have been created to facilitate the movement of vehicles and to prevent congestion, yet much has been left undone that might well be desired. Pittsburgh's parking regulations are strict, yet during the day long columns of cars fill the narrow streets and leave for passage nothing but the smallest of lanes.

All these conditions are imposed upon the city trucks, and all, without exception, make for a reduction in speed of travel, which is one of the most important factors in the efficient operation of any conveyance. Thus the Youghiogheny firm has its difficulties and what it has learned about costs of operation of trucks must necessarily be accepted with due allowance for these obstacles to efficient operations. Machines operating under mediocre or even unfavorable working conditions have, of course, not shown themselves to the best advantage.

By operating at night, many of the difficulties above mentioned have been to a degree overcome, but in their stead others have been introduced, so that the greater portion of the business is still handled during daylight hours. The only exceptions are large orders from business houses equipped with their own power plants and situated on streets that are both extremely narrow and unusually busy during the day.

The Youghiogheny Coal Co. did not, of course, adopt trucks in order that the mines of the Pittsburgh Coal Co. might be kept in operation the year around. The officials of the firm purchased the first trucks in 1912 to replace teams that were then being used to deliver coal. An account, therefore, of the activities of the company is primarily a recital of the advantages of the motor truck over team haulage.

The first trucks were procured at a time when sentiment ran high against them. Though the move, it was hoped, would prove to be an economical one, few grounds existed for any such assumption and other considerations largely influenced the purchase.

Chief of these was the humane stand taken by the officials. The company desired to give the horses then in use a little more freedom from work during the hot midsummer days and to keep them to a greater extent off the icy streets in the winter. It also was hoped that the average life of the stock might thus be somewhat raised from its excessively low figure of 53.5 months, about 4½ years.

### Much Opposition to Introduction of Trucks

Just why much opposition to the motor truck developed among retail coal coal dealers at the time in question is difficult to explain. It probably arose from the same prejudice that is shown to any method that differs radically from the one in force. It was next to impossible to find anyone who had kept a close tab on truck-operating expenses, yet the feeling prevailed that the gasoline-driven vehicle was not only expensive but highly extravagant in operation.

Much of the same prejudice is now encountered when trucks are mentioned as an economical means of keeping mines working the year round. Few operators have experimented with them, and it is difficult to gather data to prove to those operators who are open to conviction just how flexible and economical the motor truck is when operated over short hauls.

Fortunately the officials of the Youghiogheny company were shrewd business men. They had already gathered the facts as to what it was costing them to move one ton of coal one mile by team, as well as how much per hour it costs to handle a span of horses. They determined to gather like facts concerning truck operation. Merely because some livery-stable owner had

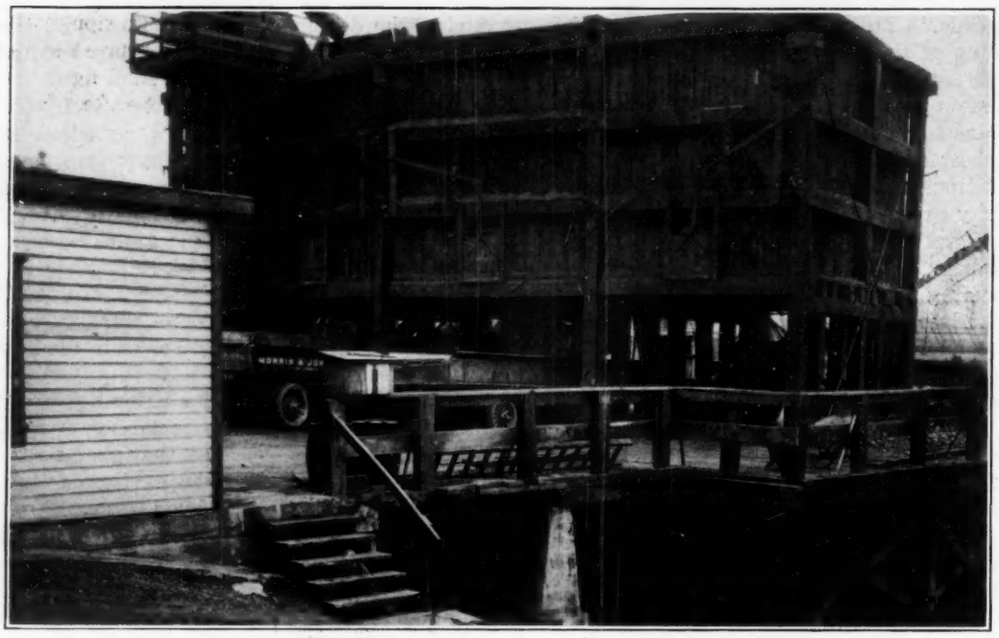


FIG. 3

**Bin Approach**

Only a small portion of the coal from these bins is handled by company trucks. Other trucksters pick up loads here. Each load is weighed upon scales near by and the truck driver is given a slip stating the net weight of his load.

ventured a bald statement about a truck that he had purchased was no reason for assuming that all trucks were uneconomical.

What this concern has learned about truck transportation in the last few years is a revelation. It was found by actual comparison with the figures of operation extending over the past year, 1919, that the company has saved over $43,000 as against the movement of the same amount of coal if handled entirely by teams. As a result orders were placed several weeks ago for ten 6-ton Packard trucks at $8,000 apiece.

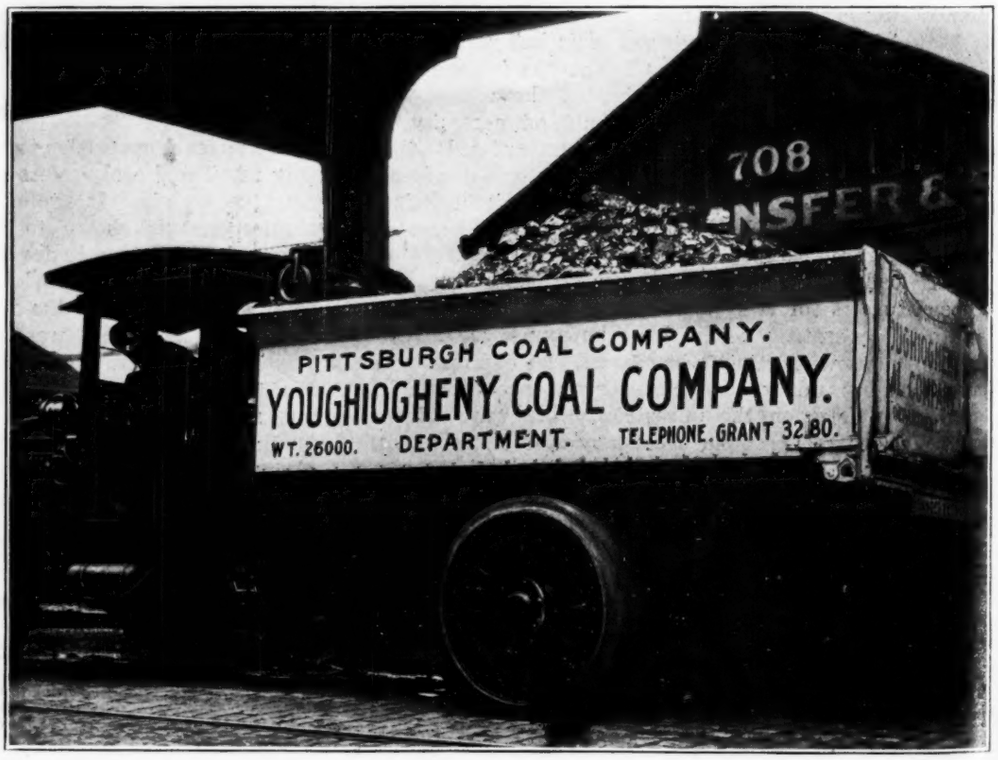
As might be expected, the Youghiogheny Coal Co. is standardizing on the type and make of motor truck used. A move of this nature is almost imperative with any concern which operates a fleet of these trucks, as only by so doing can spare parts, tires, etc., be made always available, and only by standardizing can accessories be purchased in wholesale quantities. There is the additional advantage that the repairmen work more rapidly and efficiently when they have to familarize themselves with only one type of machine.

This company has selected the Packard 6-ton truck as its standard, and with the arrival of the cars now ordered fifteen of these machines will be in use. All trucks are equipped with a Babcock cab for the protection of the driver in inclement weather, as well as Sewell wheels, which insure additional resiliency to the body. Though the chassis and cabs are standard, the construction of the bodies varies to a certain degree. Some of the machines have been built to special specifi-

FIG. 4

**Six-Ton Standard Truck**

The body may be divided into either two or three compartments, so that 2-, 3- or 4-ton consignments may be delivered. As most of the company's customers are big consumers, such as hotels, apartment houses and large office buildings, these boards are seldom used. Loads are dumped by backing against curb, and where the streets are narrow this is done at night.



cations and carry a bed that may be divided into either two or three compartments, so that two 3-ton loads or three 2-ton loads may be carried to fill small orders. The trucks built in this manner are equipped with a side discharge chute so that the compartment nearest the driver may be discharged while the machine is in restricted quarters.

### Cannot Back Truck Against the Curb

Several of the older machines were constructed with a side-discharge, rear-end, tail-gate chute to permit of unloading directly into sidewalk bin openings while the truck was standing parallel with the curb. This arrangement was deemed necessary by reason of the narrow streets in the busy downtown section, it being against traffic regulations for a machine to choke a street as it would do if unloading backward from the rear. This feature of dumping is being eliminated, however, and soon none of the trucks will have to resort to side discharge.

As already mentioned, the orders of large business houses which are situated on narrow streets are filled at night. It is thus possible without breaking any of the traffic regulations for the trucks to unload while backed-up against the curb. Rear-end unloading, is, of course, more rapid than any kind of side discharge.

It has been found that these 6-ton trucks will cover 2.15 miles on a gallon of gasoline and that an equal measure of lubrication oil furnishes sufficient lubricant to the motor for 130 miles of travel. In computing truck-operation costs, nothing is overlooked by the Youghiogheny officials. Table I shows the costs of operation of a single 6-ton truck for one year.

TABLE I. COST OF OPERATING COAL TRUCK FOR ONE YEAR

| | | | |
|---|---|---|---|
| Wages | $4,064.46 | Tires | $164.35 |
| Depreciation | 1,365.45 | Repairs and supplies | 692.28 |
| Gasoline | 1,196.11 | License | 25.00 |
| Lubricants | 119.83 | Superintendence | 179.38 |
| Garage | 700.20 | Workmen's compensation | 59.78 |
| Insurance | 369.57 | | |
| Total expenses | | | $8,936.41 |

TABLE II. AVERAGE YEARLY RECORD OF MACHINES IN SERVICE

| | |
|---|---|
| Total hours | 2,529 |
| Total miles | 9,103 |
| Tons hauled | 17,581 |
| Total expenses | $8,936.41 |
| Cost of operating one hour | $3.53 |
| Cost of hauling one ton one mile | $0.17 |
| Average tons to a load | 5.87 |

In figuring the cost of hauling one ton one mile the mileage figured is that made by the truck in running under load. The wages may appear high but this expenditure is for two men, for to each truck a driver and a helper are assigned. The company owns its own garage, but this expense is charged up to the trucks as if space of equal area were being rented. This illustrates how closely operating costs are calculated.

The operating expenses revealed by the Youghiogheny company's experience are of more than usual interest because they afford a means of answering the question: What is the maximum distance over which a motor truck can haul economically? By reason of the wide difference in the operating conditions encountered by the trucks of this firm and those traveling between mine and cellar, the hourly cost of truck operation quite possibly is a safer figure to use than that covering the cost of moving one ton of coal one mile; although, both, of course, are closely related.

This expense, shown as $3.53 in table II, is rather high because a company using trucks from its tipple over a comparative long haul probably would not have need of two men on the machine. Therefore in round figures it should not cost more than $3 per hour to operate a 6-ton

TABLE III. ONE NIGHT'S WORK OF A 6-TON TRUCK OWNED BY THE YOUGHIOGHENY COAL CO. OF PITTSBURGH

Truck "1"....Weather..Wet 54-70....Shift..Night..Date..Mar. 17, 1919
Driver..H. Coleman.....Arrived.....Helper....R. Tolbert....Arrived....

| Trip | Arrived | Time Loading Min. | Destination | Net Tons |
|---|---|---|---|---|
| 1 | 6.00 | 2 | Union Bank Building | 6.25 |
| 2 | 6.09 | 2 | Union Bank Building | 6.00 |
| 3 | 6.20 | 2 | Union Bank Building | 6.10 |
| 4 | 6.30 | 2 | Union Bank Building | 6.00 |
| 5 | 6.40 | 2 | Union Bank Building | 6.25 |
| 6 | 6.55 | 2 | Union Bank Building | 6.10 |
| 7 | 7.05 | 2 | Union Bank Building | 6.25 |
| 8 | 7.18 | 2 | Union Bank Building | 6.15 |
| 9 | 7.30 | 2 | Peoples Bank Building | 6.25 |
| 10 | 7.40 | 2 | Peoples Bank Building | 6.25 |
| 11 | 7.55 | 2 | Fort Pitt Hotel | 6.00 |
| 12 | 8.05 | 2 | Fort Pitt Hotel | 6.00 |
| 13 | 8.14 | 2 | Fort Pitt Hotel | 6.10 |
| 14 | 8.23 | 2 | Oliver Bldg. Power Plant | 6.00 |
| 15 | 8.30 | 2 | Oliver Bldg. Power Plant | 6.25 |
| 16 | 8.40 | 2 | Oliver Bldg. Power Plant | 6.15 |
| 17 | 8.46 | 2 | Oliver Bldg. Power Plant | 6.05 |
| 18 | 8.52 | 2 | Oliver Bldg. Power Plant | 6.25 |
| 19 | 9.00 | 2 | Oliver Bldg. Power Plant | 6.25 |
| 20 | 9.05 | 2 | Oliver Bldg. Power Plant | 6.20 |
| 21 | 9.10 | 2 | Oliver Bldg. Power Plant | 6.15 |
| 22 | 9.18 | 2 | Oliver Bldg. Power Plant | 6.20 |
| 23 | 9.25 | 2 | Oliver Bldg. Power Plant | 6.00 |
| 24 | 9.30 | 2 | Oliver Bldg. Power Plant | 6.20 |
| 25 | 9.36 | 2 | Oliver Bldg. Power Plant | 6.10 |
| 2 | 9.42 | 2 | Oliver Bldg. Power Plant | 6.15 |
| 27 | 9.50 | 2 | Oliver Bldg. Power Plant | 6.20 |
| 28 | 9.55 | 2 | Oliver Bldg. Power Plant | 6.15 |
| 29 | 10.00 | 2 | Oliver Bldg. Power Plant | 6.10 |
| 30 | 10.06 | 2 | Oliver Bldg. Power Plant | 6.25 |
| 31 | 10.11 | 2 | Oliver Bldg. Power Plant | 6.25 |
| 32 | 10.18 | 2 | Oliver Bldg. Power Plant | 6.00 |
| 33 | 10.25 | 2 | Oliver Bldg. Power Plant | 6.25 |
| 34 | 10.30 | 2 | Oliver Bldg. Power Plant | 6.10 |
| 35 | 10.35 | 2 | Oliver Bldg. Power Plant | 6.25 |
| 36 | 10.41 | 2 | Oliver Bldg. Power Plant | 6.20 |
| 37 | 10.45 | 2 | Oliver Bldg. Power Plant | 6.25 |
| 38 | 10.51 | 2 | Oliver Bldg. Power Plant | 6.00 |
| 39 | 10.56 | 2 | Oliver Bldg. Power Plant | 6.15 |
| 40 | 11.01 | 2 | Oliver Bldg. Power Plant | 6.10 |
| 41 | 11.08 | 2 | Oliver Bldg. Power Plant | 6.00 |
| 42 | 11.15 | 2 | Oliver Bldg. Power Plant | 6.00 |
| 43 | 11.20 | 2 | Oliver Bldg. Power Plant | 6.05 |
| 44 | 11.26 | 2 | Oliver Bldg. Power Plant | 6.10 |
| 45 | 11.33 | 2 | Oliver Bldg. Power Plant | 6.20 |
| 46 | 11.40 | 2 | Oliver Bldg. Power Plant | 6.00 |
| 47 | 11.50 | 2 | Fort Pitt Hotel | 6.25 |
| 48 | 12.00 | 2 | Chamber of Commerce Bldg | 6.15 |
| 49 | 12.44 | 2 | Chamber of Commerce Bldg | 6.00 |
| 50 | 1.05 | 2 | Farmers Bank Building | 6.25 |
| 51 | 1.15 | 2 | Farmers Bank Building | 6.10 |
| 52 | 1.25 | 2 | Farmers Bank Building | 6.00 |
| 53 | 1.33 | 2 | Farmers Bank Building | 6.05 |
| 54 | 1.40 | 2 | Farmers Bank Building | 5.95 |
| 55 | 1.50 | 2 | Farmers Bank Building | 6.00 |
| 56 | 2.00 | 2 | Farmers Bank Building | 6.00 |
| 57 | 2.10 | 2 | Farmers Bank Building | 5.95 |
| 58 | 2.20 | 2 | Farmers Bank Building | 6.00 |
| 59 | 2.30 | 2 | Farmers Bank Building | 6.25 |
| 60 | 2.40 | 2 | Farmers Bank Building | 6.10 |
| 61 | 2.50 | 2 | Farmers Bank Building | 6.25 |
| 62 | 3.10 | 2 | Farmers Bank Building | 6.20 |
| 63 | 3.22 | 2 | Farmers Bank Building | 5.95 |
| 64 | 3.30 | 2 | Farmers Bank Building | 5.90 |
| 65 | 3.45 | 2 | Oliver Bldg. Power Plant | 5.90 |
| 66 | 3.55 | 2 | Bell Telephone Co | 6.15 |
| 67 | 4.15 | 2 | Bell Telephone Co | 6.00 |
| 68 | 4.30 | 2 | Bell Telephone Co | 6.10 |
| 69 | 4.42 | 2 | Fort Pitt Hotel | 6.20 |
| 70 | 4.52 | 2 | Fort Pitt Hotel | 6.20 |

RECAPITULATION

Time from 6 p.m. to 5 a.m. is 11 hours.
Supper from 12 to 12:30 a.m.
Actual operating time is 10½ hours.
Total of 70 loads is 428.15 tons.
Total mileage is 52 miles.
Average round trip is ¾ mile.

| Delivered to | Loads | Minutes | Average Minutes to Trip | Total Tons | Average |
|---|---|---|---|---|---|
| Union Bank Bldg | 8 | 90 | 11.3 | 49.1 | 6.14 |
| Peoples Bank Bldg | 2 | 25 | 12.5 | 12.5 | 6.25 |
| Fort Pitt Hotel | 6 | 56 | 9.3 | 36.75 | 6.12 |
| Oliver Bldg. Power | 34 | 217 | 6.4 | 208.45 | 6.13 |
| Chamber of Commerce | 2 | 35 | 17.5 | 12.15 | 6.08 |
| Farmers Bank Bldg | 15 | 160 | 10.7 | 90.95 | 6.06 |
| Telephone Building | 3 | 47 | 15.7 | 18.25 | 6.08 |
| | 70 | 630 | 11.9 | 428.15 | 6.12 |

On March 17 rain threatened to fall all day. At the hour (6 p.m.) when the first load was being hauled precipitation commenced. Rain came down heavily until 11:30 p.m., when a drizzle set in for the balance of the night. A heavy wind was experienced after midnight. Owing to the wet streets the driver could not chance driving as fast as on dry streets. Neither was the efficiency of the workmen as high as on a clear, calm night, as they had to contend with heavy rains, winds and wet clothes.

truck. Greater mileage in this case would be registered per day, as far less time would be consumed in loading and unloading, for the machines would make fewer deliveries.

These trucks, when operated free of traffic regulations, should have little difficulty in averaging ten miles per hour. Location of mine and consumer and the condition of the roads traversed should not affect this speed of travel to any great degree. In the Pittsburgh district it would appear that a distance of ten miles approaches the maximum at which the trucks can compete with the railroads.

For the shipment of fifty tons of coal over ten miles in a single day two trucks would be required. This transportation might be accomplished at a cost not exceeding $50. If the railroads were to move the same amount of coal over a like distance, approximately $50 would be demanded as freight charges. Trucks, however, can in practice be operated profitably by the coal producer over a distance greater than ten miles, for this distance is merely that which will make the cost of delivering by truck the same as that for delivering by railroad car. The fact that the mine may be kept in daily operation when trucks are employed is no small consideration, and is a factor of sufficient advantage to make it advisable to haul fifteen miles instead of ten.

So many and varied are the conditions under which each operator would ship his product that only an experiment with motor vehicles would definitely determine the maximum distance that could effectively be negotiated. The Middle West, being free of steep hills, perhaps offers the best geographical location for the movement of coal by this method. Here, however, the mines are not situated near the large consumers, as they are in the Pittsburgh district.

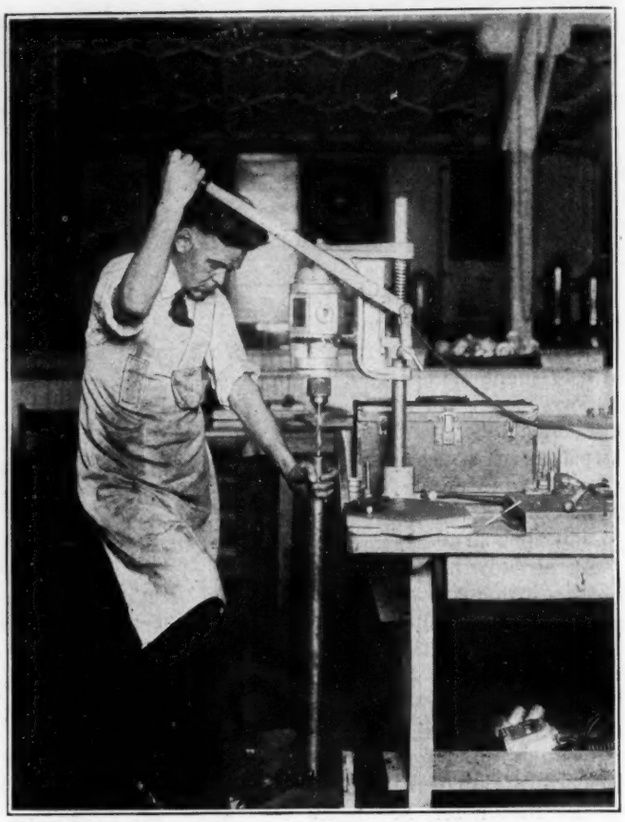
## Bench Drilling Stand Makes Fast Work Possible with Little Effort

A NEW bench drilling stand recently put on the market by the Black & Decker Manufacturing Co. takes $\frac{3}{8}$-, $\frac{1}{2}$-, $\frac{5}{16}$-, $\frac{3}{8}$- and $\frac{7}{8}$-in. Black & Decker portable electric drills, which can be quickly and easily attached and detached. The bracket carrying the drill can be raised or lowered on a vertical column and may be secured in any desired position by means of a split collar and clamping screw. The drill may be swung clear of the base, making it possible to use this stand for such operations as applying ring gears to automobile axles, drilling in the ends of shafts, and other work too high to be drilled on the bench. Both vertical and horizontal adjustments are secured by means of the clamping screw.

An extra long feed lever gives a feed ratio of 6 to 1, so that 100 lb. pressure applied to the handle feeds the drill under a pressure of 600 lb. This means fast work with little effort. In the base are six tapped holes to accommodate $\frac{1}{2}$-in. studs, used to clamp work in place. One stud with nut and clamp is supplied with the stand.

This bench drilling stand is exceptionally rigid, all parts being of unusually generous size. For instance, the vertical column is a solid steel shaft $1\frac{7}{16}$ in. in diameter. The base is provided with four holes for fastening the stand to the bench. Four $\frac{3}{8}$-in. lag screws are supplied for this purpose.

The principal dimensions are as follows: Height (bottom of base to top of vertical column), 30 in.; vertical adjustment of drill, 12 in.; drilling radius (distance from center of drill bit to circumference of vertical column), 7 in.; horizontal adjustment of drill, 360 deg. (complete circle); feed (vertical travel of drill when operated by feed lever), 4 in.; net weight, 70 lb.



ADAPTING A PORTABLE DRILL TO A BENCH STAND

Suspension on the standard is made by a spiral spring and the whole mounting bracket may be swung sidewise to clear the bench, thus rendering possible the drilling of long work.

THE ANNUAL REPORT of the chief of the Bureau of Engineering of the Navy contains the following reference to coal: "The existing Navy acceptable list and supplementary list of mines were continued in use with such slight revisions as seemed desirable in order to maintain a proper and an adequate supply of coal to the Navy. The naval commission to inspect the Matanuska, Alaska, coal fields, Captain S. E. W. Kittelle in command, returned and made a report on the conditions existing in this field. As a result of this report the Navy Department has decided to continue the investigations in this field. On May 21, 1920, Commander O. C. Dowling left Washington, D. C., for Alaska, as senior member of a naval coal commission. At the end of the fiscal year this commission was engaged in a general investigation of the facilities of the Matanuska field for supplying coal for the Navy."

THE QUARTERMASTER GENERAL of the Army in his report for the year ending June 30 last says the army purchased during the year 2,638,700 tons of coal at $11,103,932. Difficulty was experienced in obtaining the necessary supplies of anthracite coal for the army in the Northeastern and Eastern Departments because of the exorbitant prices demanded by individual anthracite producers. Arrangements, however, were made with the National Committee of Anthracite Operators which resulted in procuring coal required in these departments at $5.98 per ton, the requirements being allocated to the producers by the committee and shipped by them as allocated. This method resulted in a saving of nearly $7 a ton on approximately a milllion tons of coal.

# Problems of Operating Men

Edited by James T. Beard

## Factors Affecting Economy of Working Low Coal

*Attention is drawn to a few factors of varying importance in respect to securing a maximum of economy in the working of low coal. Particular reference is made to reducing the length of haulage roads to be maintained.*

PERMIT me to refer to the letter of V. Frodsham, which appeared in *Coal Age*, Oct. 14, p. 808, where he illustrates a combined pillar-and-stall and panel system for the working of a seam of low coal about 35 in. in thickness. The panel system that he suggests is a good idea and well adapted to the working of thin seams such as this one. However, it would seem that the question of realizing a low cost of maintenance has been almost completely overlooked in the arrangement of his system of haulage.

In the working of low coal, the problem of cost is a most important one and everything possible should be done to reduce this item to a minimum. From an inspection of the figure given by Mr. Frodsham to illustrate his method, it would appear that there are too many haulage roads to be maintained. Each panel appears to be surrounded by these roads and split with temporary tracks. Again, it would seen that there would be some difficulty in recovering the coal in the chain pillars, which would cause a considerable loss of coal, all of which means an increased cost of production by the method proposed.

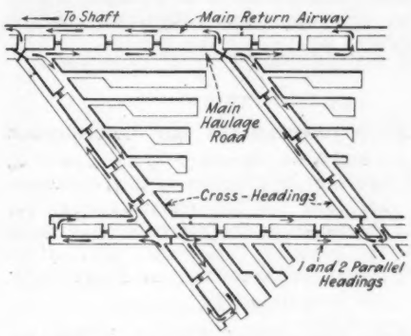
### Too Great Concentration of Work May Prove a Hindrance

It is stated that 30 per cent of the coal would be taken out in the first working, which leaves 70 per cent to be recovered when drawing back the pillars or retreating. The writer suggests taking out the pillars in skips, working ten of these at a time, or twenty on both sides of the track and employing from 80 to 100 men.

The objection to this plan, as I regard it, is that the men are in too close contact with each other and the work too consolidated. In my opinion, better results would be obtained if this number of men were scattered over a larger territory, and there would be less danger of starting a squeeze. I believe the same tonnage of coal could be produced by 40 to 50 men in place of the 80 or 100 men proposed.

My experience has been that where the men are crowded together too closely, or too large a number are put to work in the same panel, they are unable to make the same money that they could if given a larger space to work. Moreover, where the men are thus bunched together, there is more opportunity for trouble; complaints are more frequent and the chances of disagreement among themselves are increased.

Allow me, now, to refer to the plan shown in the accompanying figure, which represents a cross-heading panel system that I believe is best adopted to the working of low coal. One of the chief advantages of this plan will be found in the reduction of the number of haulage roads and the length of haul. The diagonal cross-headings shown in the figure, when laid out with due regard to the inclination of the seam, possess the advantage of facilitating the movement of the loaded cars.




DIAGONAL ROADS REDUCE GRADES AND FACILITATE HAULAGE

As indicated in the figure, it is possible to drive the rooms off these diagonal roads in a direction such that the grade of the track will favor the movement of the loaded cars. In like manner, rooms can be turned off the other headings paralleling the main haulage road, and the grade in these rooms also will favor the movement of the loads.

In working this seam my plan would be to take up enough bottom on the roads to give the required headroom for the cars. I have generally found that brushing the roof leaves it in bad shape and gives future trouble. I would lay out the work so as to drive the rooms from 80 to 100 yd. in length. The roomnecks should be driven 12 ft. wide for a distance of, say 50 to 60 ft., and then widened out to a width of 20 or 24 ft.

This arrangement will leave a barrier pillar not less than 50 ft. in width for the protection of the headings until the panel is finished, when everything can be drawn back. It will seldom happen that there will be more than from 15 to 30 men working a single panel, which will afford the men every advantage for putting out the largest amount of coal.

G. W. BREEDEN.

Thorpe, W. Va.

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## The Safe Miner

*Probably the most important item affecting the safety of the average miner is his attitude toward the timbering of his place, though there are few miners, indeed, who realize the truth of this statement.*

READING the several letters discussing the question of what constitutes a skilled miner, particularly the letter of an assistant foreman of Johnstown, Pa., which appeared in *Coal Age*, Nov. 11, p. 1003, I have been impressed with the idea that the really safe miner is the one who presents a favorable attitude toward the timbering of his place.

The fact is well known that the largest number of mine accidents is caused by falls of roof and coal, and their frequency is none the less as time goes by. It would be interesting to have the views of our men and learn of the methods followed in certain fields and in individual mines having good records for safety. To my mind the greatest factor that distinguishes the safe miner from one who employs unsafe methods is the attitude of the man toward the timbering of his place.

### Miners Naturally Indifferent To Their Own Safety

There are certain well known conditions common to workers in all coal fields, and these conditions must be met successfully if mine accidents are to be avoided. Ignoring for the time those physical conditions that call for special methods of timbering the working places in different mines, probably the most difficult condition to be met in mining is the downright indifference of the average miner regarding his own personal safety, and the childlike logic displayed by many when giving their reasons for having failed to set needed timbers and make their places safe before doing other work.

Almost invariably a miner will point to the posts behind him and claim that he cannot set timbers nearer the face as they would be in the cutter's way. The truth of the matter is that he does not want the extra work and prefers to run the chance of being caught. Men who assume that there is no danger are generally the first to get hurt. Such men take no extra precautions to safeguard themselves. But where a man once *realizes* that he is

working under a roof that is unsafe he will either timber it or get out.

However, the safer plan to pursue is for a man not to depend wholly on his judgment regarding the condition of the roof above him. Should his judgment fail he may pay the penalty with his life. A uniform method of timbering and the setting of extra posts under bad roof are the surest safeguards against this class of accidents.

Speaking of uniform methods of timbering, preferences will differ, but having adopted the method best suited to the particular conditions in the seam that method should be closely followed and there must be no delay in setting the timbers before performing other work. This is of the greatest importance at the working face, where men are employed 80 per cent of the time they are in the mine.

### Set Temporary Posts Near Face

It is no excuse to say that the cutter must have elbow room and posts cannot be set nearer than twelve feet to the face. To adopt such a plan is to invite accident. The difficulty can be avoided by setting temporary posts, which the cutter can remove as his machine reaches the place, resetting the same afterward. A cutter may be careless and fail to reset the post; but in that case the miner will lose only a few minutes in doing the work.

A most common fault of miners, particularly in the setting of temporary posts, is their failure to do the work properly. A post that is not set plumb, with a well balanced cap above it, is a menace to safety. How often it happens a man is found caught by a fall of slate with good timbers lying buried at his side. A post that is not properly set will invariably fail when it takes the weight. The same care must be taken in setting mine timbers as in standing supports beneath a building. They must be plumb and the weight well balanced.

### Every Miner Knows What Work Rightly Belongs to Him

The most difficult problem the mine foreman has to combat is the attitude of the average miner regarding his own safety, and his natural disposition to take chances. It is not wise for the foreman to ask a miner to do work that does not naturally fall to his lot. The man thinks that he is being asked to do something for which he is not paid. Every miner knows, however, that it is a part of his work to make himself safe.

When a foreman goes into a man's place and begins to upbraid the man for not having set needed timbers he is most sure to meet with a rebuff, as the average miner will resent the imputation that he has failed in his duties. A good rule is to mark up the place and say to the man, "Bill, when you put these posts up you will have your place in good shape." This gentle reminder will be all that is needed to bring prompt action in most cases.

It is a dangerous practice to follow the plan that some foremen and assistant foremen are apt to regard as the line of least resistance and start to set a miner's timbers for him. It is obvious that such a plan cannot be followed to any extent in a large mine. It establishes a bad precedent, as many miners will leave this work until the foreman or an assistant comes around, in the hope that it will be done for him, at least in part. The miner will be good natured about it, but this much needed work will be constantly delayed and the miner exposed to danger, for which he has a natural contempt.

The making of rules is one thing, but their enforcement is quite a different thing. The visits of a foreman or his assistants will not number more than two or three a day, each lasting perhaps five minutes. As a consequence the miner is alone practically the entire time he is in the mine.

Under the conditions prevailing at present the foreman has no "big stick" to cause or urge compliance with rules and regulations. His only safe course, therefore, is to strive to change the attitude of the miner, and bring him to realize his responsibility for his own safety. See that he has the needed tools, which must always include a good ax, and supply him with what timber is needed and watch the results.

Pikeville, Ky. G. E. Daugherty.

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## Preparedness for the Unexpected

*An important lesson is often taught by the sad experiences of a great disaster; and we can learn at least one lesson from the calamity that befell the generally up-to-date mine of the Union Collieries Co., at Renton, Pa., not long ago.*

With deep regret one reads accounts of instances where the work of rescue, following a mine disaster, is handicapped by reason of the lack of a properly equipped rescue crew. Such it seems was the case at the explosion that occurred, July last, at Mine No. 3 of the Union Collieries Co., located at Renton, Pa.

The Renton mine had always been considered well equipped and up-to-date. Its machinery, including the ventilating fan was operated by electric power furnished by another company. The mine was well ventilated and such a thing as a serious explosion had not been expected. It might be said it was farthest from the thought of the management. The result was this unlooked for occurrence found the company wholly unprepared, there being no suitable apparatus and appliances available for descending the 509-ft. shaft and conducting the work of rescue.

### Rescuers Are Handicapped

After reading the interesting letter of Richard Bowen, *Coal Age*, Oct. 28, p. 904, regarding the heroic work of the Bureau of Mines rescue crew, who reached the mine in record time only to find that they were sadly handicapped by reason of the lack of suitable means for descending the shaft, I have been impressed with our general lack of preparedness for the unexpected things that so frequently happen.

The Bureau of Mines' men, on their arrival, found that a mere excuse for a bucket had been made fast to the end of a ⅝-in. wire rope, and this was the only available means at hand for lowering men into the shaft, a depth of 509 ft. What followed is well described by Mr. Bowen, who rightly regards the work of one member of the rescue team as foolhardy, notwithstanding the acknowledged fact that it was heroic.

### Why Are Not Rescue Cars Equipped With All Needed Appliances?

The account leads me to offer one suggestion that may prove of value should a similar condition arise in the future. The thought comes to me, Why should not every rescue car provided by the Bureau of Mines, be equipment with a suitable bucket and a sufficient length of ½- or ⅝-in. rope, coiled on a reel that could be quickly mounted and the rope made available for use in descending a shaft in which the hoisting apparatus had been destroyed or rendered useless by the explosion.

The same suggestion will also apply to equipping every mine with an extra length of rope that would be at once available under similar conditions. The mine equipment should also include a strong bucket capable of holding two men. Every up-to-date mine should have a well organized, trained rescue team, familiar with rescue and first-aid work. The equipment should include approved breathing apparatus, safety lamps, and other rescue and first-aid appliances and supplies. These should be examined and tested at regular intervals, so that everything will be available and in good condition when needed.

### Rescue Teams Should Visit Mines

Very much can be done in the way of being prepared for what we do not expect but which is liable to happen. I would suggest further that it would not be a bad plan for state and government rescue teams to have their members visit the mines in their several districts, from time to time, for the purpose of being more fully acquainted with their conditions and knowing what equipment is available should the occasion require. In this way, much can be done to strengthen rescue organizations in the different mines and improve their equipment.

Another thought comes to me in this connection. Would it not be well for every Mine-Safety Committee to map out the quickest and safest roads for men to follow in getting out of the mine. These roads should be marked plainly not only by a white arrow showing the direction to be taken, but also by some means that would enable a man to determine, in the dark, the proper direction to take to reach the mine entrance.

At Renton, the foreman made the fatal mistake of permitting men to enter the mine after the ventilation had

been cut off for a considerable time and before the mine had been examined and found to be safe. It is understood that this was contrary to orders and the dread result should emphasize the necessity of absolute compliance with safety rules and regulations on the part of mine officials and men.

Gans, Pa. R. W. LIGHTBURN.

## Origin and Growth of Coal

*Many of the facts taught by a careful study of the geological conditions and characteristics of coal seams help to make the mining of the coal less difficult and far less dangerous. A lack of this knowledge on the part of the miner is often his chief handicap.*

FROM time to time there have appeared in *Coal Age*, articles and letters relating to the origin of coal and the gradual changes that have taken place in its formation. I recall one excellent article by C. W. Hippard, explaining the various theories relating to the origin of coal, Vol. 16, p. 104. On page 460 of the same volume Richard Bowen, wrote an interesting letter in which he appeared to favor the "Drift Theory" of the formation of coal; and a little later Robert McCune, in another letter, Vol. 17, p. 150, urged the *in situ* theory as being the most acceptable.

Concerning the history of coal, the seams themselves tell us many things regarding their origin; but other matters, particuarly the length of time required for the transformation to take place, are left wholly to speculation. Science has positively determined that the origin or source of our coal is the growth, development and decay of vegetable matter.

During the long ages of transformation this matter was overspread with other deposits and subjected to tremendous pressure, with the consequent development of heat. By these agencies the vegetable matter was finally transformed into mineral coal. But regarding the length of time required to effect these changes no definite information is afforded.

We are told that the coal-forming period in the history of the earth was introduced by climatic conditions that invited and sustained a luxurious plant growth, which provided immense quantities of vegetable material as year followed year. The successive growth and decay of this material continually added to the deposits that were to form the coal. The *in situ* theory describes this growth and deposit of vegetable matter as taking place where the beds of coal are now found. On the other hand, the "drift" theory describes this material as having been drifted from the places where it grew and deposited later where the seams of coal were formed. To my mind the former of these two theories appears the more plausible one. If the coal-forming material drifted from other localities to the place where the coal is found I would like to ask, Where is it supposed to have originated?

All students of geology agree that the time during which our coal was in forming has been immensely long, perhaps hundreds of thousands of years. It is easy to understand that during this long interval of time the coal measures, through the action of geologic forces, have been alternately submerged and elevated and that foreign matter such as sand and clay were deposited from the overflowing waters and later formed the interstratified shales, slates, limestones and sandrocks of the coal formations.

With Richard Bowen, I believe that if the conditions affecting the formation and character of coal seams were studied more closely the knowledge gained thereby would be of great assistance in the intelligent and systematic planning of mines. It is strange how little the average miner, who has spent the most of his life in coal mines, knows or thinks of the geologic forces that have given rise to the slips, faults, and pinchouts with which he comes in contact in mining the coal.

It goes without saying that if the miner had a broader knowledge of the conditions and forces that prouuced these disturbances with which he is familiar in the mines it would make him more cautious in his methods of mining, and enable him to protect himself better from falling roof where the formation is traversed by slips and faults or rendered dangerous by reason of other changing characteristics. Could the violent as well as the slower changes that have taken place during the formation of coal seams have been photographed, and were these now to be passed before our eyes like a moving-picture scene, we would witness a sublime spectacle that would tax the imagination to grasp. JOHN ROSE.

Dayton, Tenn.

# Inquiries Of General Interest

## Heating Locomotive Feedwater in Injector Practice

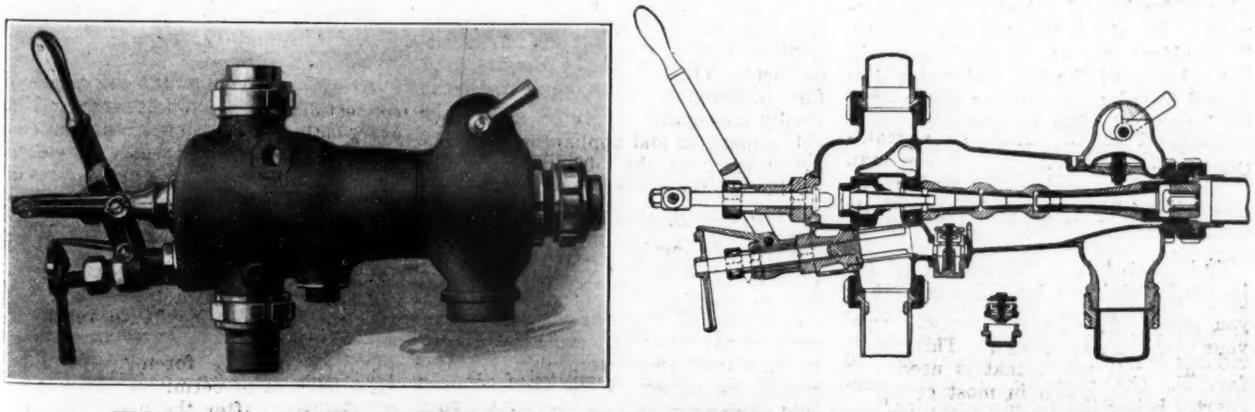
*Heating the feedwater of a locomotive or other boiler equipped with an injector, for the purpose of saving fuel, is only applicable to a limited extent, as the injector fails when the water is too hot.*

AT OUR colliery, we are operating eight steam locomotives on the surface. These are equipped with William Sellers injectors. At present we are using feedwater at a temperature of 40 deg. F. and it has been suggested that a large saving in fuel could be effected by heating the feedwater to a temperature of, say 180 or 200 deg. F. The objection has been raised, however, that the injectors will not handle water at this high temperature. The water is carried in saddle tanks astride of each locomotive boiler, which maintains a fairly uniform temperature of about 40 deg. in the tanks.

What has *Coal Age* to say in regard to this suggestion? Is it a good one and will the injectors operate under this increased temperature?

Wilkes-Barre, Pa. ENGINEER.

A little reflection on the dual principle that controls the action of an injector using steam will serve to make



FRONT VIEW AND CROSS-SECTION OF THE WILLIAM SELLERS, "CLASS N," IMPROVED INJECTOR

clear the fact a relatively larger percentage of the heat energy of the steam supplied to the injector is transferred to the injected water as the difference in their temperatures is greater. In other words, the lower the temperature of the feedwater, the higher the efficiency of the injector.

To explain in another way, assume a boiler pressure of 160 lb. gage, at sea level, corresponding to an absolute pressure of, say 175 lb. per sq.in. At this pressure, the temperature of both the steam and the water in the boiler is 371 deg. F.; but the heat per pound of steam, at this pressure (1,196 B.t.u.) is far greater than the heat per pound of water (343 B.t.u.), owing to the amount of heat absorbed and rendered latent in the steam (853 B.t.u.).

The accompanying figure shows a view and sectional arrangement of the "Class N," improved Sellers injector. the general action of which is too well known to need description here, further than to say the present improved type consists of a movable combining tube that is made automatic, self adjusting to provide against changing pressures.

As previously stated, there is a dual principle involved in the operation of an injector. At the zone of contact of the steam and water, the condensation of the steam to water at the temperature of the feed develops a heat energy that is imparted to the water. In addition to this, there is formed by the condensation of the steam a vacuous condition, which increases the head that forces the water into the boiler.

The theoretical velocity of water due to a pressure equal to that to be overcome in the boiler is

$$v = \sqrt{2gh}$$

$$= \sqrt{64.32 \times \frac{175}{0.434}} = 161+ \textit{ ft. per sec.}$$

Owing to the expansive quality of steam, it is estimated that the rush of steam, for the same pressure head, is about twenty-two times that of the water or $22 \times 161 =$ say 3,540 ft. per sec. The difference in these two velocities is suggestive of the heat energy of the steam that is imparted to the water, which is thereby injected into the boiler.

Making all due allowances for frictional and other resistances and possible reduction of velocity in the passage of the steam through the injector, it is evident that any slight increase in the velocity of the injected water, imparted to it by the rushing steam—say an increase to 200 ft. per sec. would represent a pressure much in excess of the boiler pressure; thus,

$$p = \frac{0.434 \times 200^2}{64.32} = \textit{say } 270 \textit{ lb. per sq. in.}$$

It is stated in a "Handbook of Injectors," published by William Sellers & Co., Philadelphia, Pa., "Cold water is best for the injector. Hot water reduces the life and efficiency. At 120 deg. F., the capacity is about one-quarter below the listed capacities."

# Examination Questions Answered

## Anthracite Foremen's Examination, Tenth District, May 4, 1920

*(Selected Questions)*

QUESTION—*What is the angle made by two lines, the bearings of which are N 25° W and S 12° W?*

ANSWER—Since one of the bearings is in the northwest and the other in the southwest quadrant the sum of the bearings and the angle included between the two lines is 180 deg. Therefore, the included angle is 180 — (25 + 12) = 143 deg.

QUESTION—*How much air will be required to dilute 500 cu.ft. of methane to a mixture containing 4 per cent of the gas?*

ANSWER—In this case, 500 is 4 per cent of the proposed mixture of air and gas. The volume of the mixture is, therefore, 500 ÷ 0.04 = 12,500 cu.ft., and the required air volume is 12,500 — 500 = 12,000 cu.ft.

QUESTION—*What is the lowest oxygen content in which an oil-fed flame will burn?*

ANSWER—When no carbon dioxide is present or any extinctive gas other than the nitrogen of the air, an oil-fed flame will cease to burn when the oxygen content falls to about 16.4 per cent. If the oxygen of the air has been depleted by the addition of carbon dioxide, however, an oil-fed flame will be extinguished when the oxygen content ranges from 17.6 to 18 per cent.

QUESTION—*(a) What danger should be guarded against when driving a gangway in the direction of old abandoned workings? (b) How would you provide against those dangers?*

ANSWER—(a) In driving a gangway in the direction of abandoned workings, it is necessary to safeguard the work against the possibility of tapping a body of gas or water that may have accumualted in the old works.

(b) To avoid this danger, a borehole should be kept at least 20 ft. in advance of the face of the heading and flank holes making an angle with the direction of the heading should be drilled in each rib. The width of the entry shall not exceed 12 ft., as required by the Anthracite Mine Law.

QUESTION—*If it requires 5 hp. to produce 30,000 cu.ft. of air per minute, in a certain mine, what horsepower will be required to produce 90,000 cu.ft. in the same mine?*

ANSWER—In mine ventilation, the power producing the circulation varies as the cube of the quantity of air. In this case, if the air is to be multiplied three times the power must be increased in the ratio of the cube of 3 or 27 times. The required horsepower is, therefore, 5 × 27 = 135 hp.

QUESTION—*The horizontal distance between two stations is 200 ft. If the elevation of one station is plus 30 ft. and the elevation of the other is minus 30 ft., what is the distance between the stations referred to, in the mine?*

ANSWER—The vertical height of the one station above the other is 60 ft., and the distance between the two stations, as measured on the incline or pitch of the seam, is $\sqrt{200^2 - 60^2} =$ 208.8 ft.

QUESTION—*(a) How much must the ventilating pressure be increased in a mine in order to double the quantity of air in circulation? (b) How much must the power be increased to double the quantity?*

ANSWER—(a) In mine ventilation the pressure varies as the square of the quantity of air in circulation. Therefore, to double the air the pressure must be increased $2^2 = 4$ times the original pressure.

(b) Likewise, the power producing a circulation varies as the cube of the quantity of air; and, in this case, the power must be increased in the ratio of $2^3 = 8$ times.

QUESTION—*The quantity of air passing through a crosscut, in a gaseous mine, is 20,000 cu.ft. per min. and the area of the crosscut is 30 sq.ft. Would the law permit the use of gauze safety lamps in this opening?*

ANSWER — The velocity of the air passing through the opening is 20,000 ÷ 30 = 666⅔ ft. per min. The Anthracite Mine Law (Art. 10, Rule 7) limits the velocity of air in any opening, in a gaseous mine where gauze safety lamps are in use, to 450 ft. per min. Therefore, the use of gauze safety lamps in this opening would be unlawful.

QUESTION—*What are the advantages and disadvantages of electric safety lamps?*

ANSWER—The illuminating power of an electric mine lamp is greater than that of any oil-burning lamp. As compared with safety lamps, the electric lamp can be worn in the cap, leaving the hands free to perform work. There is no danger of explosion in the use of an electric lamp, unless the bulb is broken.

The disadvantage in the use of electric lamps is that the lamp gives no indication of a dangerous atmosphere, and the worker has no warning that he is breathing impure air until he is overcome.

# Nova Scotia Miners to Vote on Montreal Agreement

## Rejection May Not Mean a Strike in View of Wage Reductions in Other Trades and Results in West Virginia and Alabama

TILL a referendum vote has been counted it will not be possible to know how the Nova Scotia miners view the agreement signed tentatively at Montreal, Nov. 8, by the operators and representatives of the mine workers. Even if the agreement is rejected a strike will not necessarily follow.

To recapitulate, meetings of the operators and mine workers were held Oct. 20 and 21 at Montreal, at which representatives of the Dominion Coal Co., Ltd.; Nova Scotia Steel & Coal Co., Ltd., and the Arcadia Coal Co. were present, as also Robert Baxter, president, and J. B. McLachlan, secretary-treasurer of District 26. The Department of Labor was represented by Gerald H. Brown, assistant Deputy Minister, and the Royal Commission by E. McQuirk, chairman.

The mine workers were prepared to make extremely drastic demands, but were anxious to learn to what extent they would be backed by the International authorities. They therefore desired that the meeting be adjourned till Nov. 3. The interim was used by Baxter and McLachlan to attend conferences at Montreal and Indianapolis. According to their own statement on Nov. 13 they soon found that it would be best to accede to the best terms available. At Montreal they learned that the shipbuilding trades, the textile workers and the boot and shoe workers were already accepting reductions in wages and were even offering to work for less money, and also that the number of unemployed was increasing.

### Has Too Many Strikes to Handle Already

At Indianapolis they found the International union in a quandary because it had fathered two expensive strikes—one in Alabama and one in West Virginia. It did not see how it could, in addition, manage to take care of 40,000 striking men in Nova Scotia. They learned that coal prices had fallen in the United States, and, although they wrongly ascribed that fall to government intervention, it was nevertheless a fact that it had occurred, and it promised severe competition for the Nova Scotia operators and hence for their employees.

Here it may be well to quote a further statement of Mr. Baxter made on Nov. 17. He said: "It costs from $4.60 to $5.60 a ton to produce coal in the Province of Nova Scotia. In the United States the men produce upward of three tons each day. An increase of 27 per cent to them adds possibly 40c. a ton to the coal cost. In Nova Scotia an increase of 27 per cent would raise the cost of coal $1.25 per ton. Thirty-five per cent of the mine workers in the United States are datal [day] workers, but in this province from 65 to 70 per cent are datal hands."

But, to refer again to the Baxter-McLachlan statement of Nov. 13, they learned other unpleasant truths. Gerald H. Brown, Deputy Minister of Labor, informed them that the government's orders for ships' plates from Sydney would run out in the course of a week. Already the federal government had sent a man to Europe to sell steel products for the manufacturers of Nova Scotia. It looked as if the companies would have to shut down. In fact McLachlan on Nov. 21 declared that the Dominion Steel Co. would let out its furnaces if there was a coal strike and make necessary repairs. Nor was this all; the government was strongly against a strike and was known to be preparing to send the Northwest mounted police into the district to protect any who might want to continue working.

### To Meet Conditions Signed Montreal Pact

In face of the uncertainty, now grown to a painful assurance, and with John P. White to back them as representative of the International union, Baxter and McLachlan met the operators and tentatively agreed that tonnage rates be increased 10c. per ton and that day hands be advanced 55c. All local contract rates were to be advanced 12½ per cent. The new contract was to become effective as of Nov. 1, 1920, and to run to Nov. 30, 1921, it being agreed that both parties would meet in Halifax twenty days before the expiration of the agreement to arrange for a new understanding.

Right to hire and discharge is vested solely in the companies, except that no discrimination is to be shown because of any man's affiliation with the United Mine Workers of America. Collieries are to commence to hoist coal at 7 a.m., when all men must be in the mine. The day's work will cease at 3 p.m., when "all arrangements will be available for conveying men to the surface." The surface men around the bankhead and screens associated with the handling of coal are to be on duty from 7 a.m. to 3 p.m. and "for a short time after, if necessary, for the purpose of attending to such duties as will facilitate their own work, such time not to exceed a half hour." Other surface laborers around the collieries will work from 7 a.m. to 4 p.m. with half an hour for dinner.

The union may not, because of a dispute, close the mine unless that dispute arises out of a refusal of the employer to pay on the regular payday without satisfactory explanation or because of a condition which endangers life or limb. The usual arbitration clause is made part of the suggested contract, but the provision is added that if within ten days the representatives of the operators and miners fail to agree upon an arbitrator an arbitrator shall be selected by the Prime Minister of Nova Scotia, who shall make such a selection within ten days, and such selection shall be final, the miners to continue at work from the inception until the final adjustment.

The writing of a "funeral" clause, regulating layoffs when funerals take place, is left to be decided later. Housing and rent "are not a part of this contract." The contract specifically recognizes that bettered housing should command more rent. Where delivered coal to the miner is sold at less than $2.25 a ton it shall be raised to that figure, and if any railroad transportation is a part of the delivery system the cost of that service shall be added.

### Truro Convention Turns Down Agreement

A convention was called on Nov. 16 at Truro so that the officials of district 26 might present an argument in favor of the suggested contract. Some of the delegates were already instructed against it, notably those of Dominion 1 local. Fire was directed on the "hiring-and-discharging" and the "housing-and-rental" clauses. On Nov. 19 the convention turned down the proffered agreement, but this is no more final than its acceptance by the officials. The man behind the pick is yet to be heard from, and meanwhile Baxter and McLachlan will swing the circle and argue for what they have signed.

They will explain that there is still the MacKinnon award, which terminates Jan. 31. Giving thirty days' notice at that time the men will then be fully entitled to demand a new contract. By that time it will be March. With more and more men out of work, with coal plentiful, with the winter ended, more industrials accepting lower wages and with prices falling, will the miners be able to make as good a bargain as has been already offered them?

The case argued by Baxter and McLachlan seems clear. It is safe to prophesy that the contract will be accepted. If it is not there must be another vote, and even then a strike will be called if only 75 per cent of the men concur, and it will have to be made in violation of contract. The International Union may back it with money or, what is more likely, may refuse to do so.

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THE NAVY HAS requested Congress to appropriate $37,000,000 for its use during the next fiscal year for coal and other fuel including expenses of transportation, storage and handling.

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A TOTAL OF $3,469,638 has been asked by the Director of the Bureau of Mines for the work to be conducted by that bureau during the next fiscal year. A considerable portion of that fund is spent directly or indirectly in the interest of the coal-mining industry.

## Bituminous Output in 1920 by Groups of States Estimated by Geological Survey

ESTIMATES by the Geological Survey on bituminous production, by section and state, in the first ten months of 1920 have just been issued. As the estimates are based on rail shipments, it is sometimes difficult to apportion the tonnage of a road originating coal in more than one state, and the figures are therefore tentative and subject to revision. By groups of states the 1920 production has been as follows, shown in the first column as the total for the ten months, January to October, and in the second column as a full year's production at the same rate:

PRODUCTION OF SOFT COAL IN THOUSANDS OF NET TONS

| Section | First Ten Months of 1920 | Year 1920 at Same Rate as First Ten Months[7] | 1919 | 1918 | 1917 |
|---|---|---|---|---|---|
| Northeast[1] | 271,388 | 323,983 | 288,250 | 351,365 | 333,440 |
| Southern Appalachian[2] | 20,628 | 24,626 | 20,420 | 26,083 | 26,381 |
| Eastern Interior[3] | 106,408 | 127,030 | 94,600 | 130,768 | 122,953 |
| Western Interior[4] | 24,357 | 29,078 | 22,590 | 30,724 | 30,707 |
| Mountain States and Northwest[5] | 31,502 | 37,607 | 32,090 | 40,341 | 38,212 |
| Totals[6] | 454,283 | 542,324 | 457,950 | 579,281 | 551,693 |

(1) Michigan, Pennsylvania, Ohio, West Virginia, Maryland, eastern Kentucky and Virginia. (2) Alabama, Georgia, and Tennessee. (3) Illinois, Indiana, and western Kentucky. (4) Iowa, Kansas, Missouri, Oklahoma, Arkansas, and Texas. (5) Colorado, New Mexico, Utah, Wyoming, Montana, North Dakota, and Washington. (6) Alaska, California, Idaho, North Carolina, Oregon, and South Dakota not included. (7) The first ten months contained 258 out of the 308 possible working days of the year.

Comparison of 1920 with the earlier years is assisted by expressing the 1920 rate in terms of per cent of 1918 and 1917, as given in the following:

| Section | Per Cent of 1918 | Per Cent of 1917 |
|---|---|---|
| Northeast | 92 | 97 |
| Southern Appalachian | 94 | 93 |
| Eastern Interior | 97 | 103 |
| Western Interior | 95 | 95 |
| Mountain and Northwest | 93 | 98 |
| Totals | 94 | 98 |

Of the five sections, the Eastern Interior has made the best record in 1920 in comparison with the war years, producing at 97 per cent of the 1918 rate and 103 per cent of the 1917 rate. The other Western fields, Western Interior and Mountain-Northwest, have averaged about 95 per cent of the war rate. Least favorable is the position of the Southern Appalachians and the Northeast. In the former, 1920 averaged 94 per cent of the war rate. In the Northeast, supplying the Lake, Canadian, New England and export movements as well as the region of greatest industrial activity in the United States, the 1920 production has averaged 97 per cent of the 1917 rate and 92 per cent of the 1918 rate.

## Royalties Paid on Anthracite Output

CURRENT discussion of conditions in the coal markets have been marked by references to royalties paid by anthracite-mining companies to owners of anthracite lands, particularly the Girard estate, and there seems to be some confusion as to the actual facts. Considerable detailed information can be found in the report of former Judge Gordon, who as master in a case involving Girard estate leases made a report to the Orphans Court of Philadelphia, under which a decree was handed down March 3, 1920.

The Girard estate is getting an average of about 20 per cent of the mine price of coal, all sizes, from all of its tenants. The actual percentage charged in the leases themselves varies. In the case of one lease it is 16 per cent, nine others carry 18 per cent, three are for 20 per cent, and one—the Locust Mountain property—pays 28.1 per cent. These percentages are based upon the selling price of coal, all sizes, f.o.b. mine, the output of all tenants being lumped to get the average price. This average price, so determined, governs the payments for the succeeding year. Thus the average price per ton f.o.b. mine in 1919 is the basis upon which the percentages this year have been collected.

The average receipts of the Girard estate per ton have grown almost continuously since 1914. The royalties received have been as follows: 1914, 54c.; 1915, 55c.; 1916, 53c.; 1917, 62c.; 1918, 76c.; 1919, 97.9c.; 1920, $1.094. Royalties to be collected next year probably will be considerably higher.

Girard estate leases are based not only upon the sliding scale but on a guaranteed minimum royalty. The master's report referred to above says that by the beginning of this year the Girard estate had received an amount equal to the entire minimum royalties calculated to the end of the present leases, which do not expire for eight years more. The report also said that the figures showed that while for the year 1919 the lessees actually lost $731,352.26 as one of the results following war-time fuel regulation, the Girard estate that year received from its lesees $2,051,933.37. "The leases have been extremely profitable to the Girard estate," the master said.

Average f.o.b. mine prices for 1919, on which the Girard estate is now collecting royalties, run thus: Egg, $6.50; stove, $6.75; nut, $6.88; pea, $5.11. On that basis it can be calculated that the Locust Mountain Coal Co., which has the highest royalty rate—28.1 per cent—is paying a royalty of $1.933 per ton on nut coal. As a matter of fact the recorded testimony of Captain Archbald, engineer for the Girard estate, is that the Locust Mountain Coal Co. will average a royalty of $1.494 per ton on all sizes of coal for 1920.

To use the Locust Mountain Company for a further illustration, it can be said that if the price of nut coal at the mines on the Girard estate this year averages $9 a ton the royalty to be paid next year will be 28.1 per cent of that amount, or $2.529 a ton. It might be added that the income of the Girard estate is exempt from the customary income taxes, as it is a charitable institution.

Testimony was given before the U. S. Senate Committee in Pottsville, in January, 1919, regarding royalties paid to the Girard estate, and it was brought out at that time that when the Fuel Administration increased the miners' wages and allowed barely enough—or even not enough—to be added to the price of coal to cover that additional expense, this addition to the price constituted a basis upon which royalties would be collected in the future. It was brought out as a distinct possibility that the cost of coal would be put so high as to ruin companies operating under lease.

The illustration of this was worked out in this way: Suppose a wage increase to be given, as was done under the Fuel Administration, which would add $1 to the cost of a ton of coal at the mine. The Locust Mountain Company, for instance, by increasing its price $1 to meet this expense would thus make itself liable for 28.1 cents a ton additional royalty to the Girard estate. If the price of coal were raised $1.28, to cover both the wage increase and the royalty, then the following year the percentage would be based on that entire increase, and so on. The Gerard estate is not the sole lessor of anthracite lands, but its policy with regard to leasing forms a sort of standard which other landowners have endeavored to establish when executing leases of their property to operating companies.

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COAL CONSUMED BY public utilities and central power plants in September was 3,013,429 net tons, approximately the same as in August and slightly greater than in any month this year since March, according to the division of power resources of the U. S. Geological Survey. The total amount of fuel used by public-utility plants in generating electricity from January to September, 1920, is given as 27,700,000 short tons of coal, 9,900,000 barrels of fuel oil and 18,200,000 cubic feet of gas. Compared with the same period of 1919 there was an increase of 15.5 per cent in power output, a portion of which increase was obtained from water power.

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THE SUIT OF P. M. Riefkin to recover $491,000 from the Du Pont de Nemours Co., of Delaware, as compensation for obtaining for the company 3,168,000 tons of bituminous coal and 41,000 tons of anthracite is being tried in the District of Columbia Supreme Court. He claims a commission on the basis of 15c. a ton for the bituminous and 20c. for the anthracite.

# Existing Legislation Will Assure Adequate Coal Production, Morrow Says

INTERVIEWED by a representative of the United Press in regard to the necessity for further legislation for the coal industry, J. A. D. Morrow, vice-president of the National Coal Association, spoke as follows:

"I notice some talk of the need of legislation for the regulation of the coal industry. This is surprising, and proceeds, I am sure, from failure to understand what legislation is now available for the protection of the public against interference with the sufficiency of coal supply for the nation.

"There are some 10,000 soft-coal mines open and shipping coal. These mines are fully equipped with underground haulageways, ventilating systems, mechanical equipment and employees, so that they can produce year in and year out some 700,000,000 tons of bituminous coal. This is 30 per cent more coal than the country usually needs. Accordingly there is no shortage of coal-mining facilities or potential ability to ship more than enough coal for everybody.

"With 7,000 producers, operating 10,000 mines in twenty-six different states, it is nonsense to talk about combinations among bituminous-coal producers to restrict production or put up prices. There are thousands of acres of coal deposits adjacent to railways which can be opened at any time that the open market offers opportunity for profit. During the last year on one railroad more than 1,000 new mines were opened. There can be no successful combination among producers for the restriction of production under such conditions as these, any more than the farmers can successfully combine to put up the price of wheat, corn, cotton or other agricultural commodities. You ask, then, what causes these periodical shortages of coal. Just two things.

### Esch-Cummins Law Safeguards Transportation

"First, some deficiency of transportation which for a period makes it impossible to ship from the mines the tonnage of coal needed to meet current demands. This is a matter, it may be argued, against which the public should be safeguarded and protected. I agree. What is not generally understood, however, is that this has already been done, and that the public now, through ample legislation, is fully protected against that kind of emergency. I refer to the Esch-Cummins law—the new Transportation Act.

"On June 1 of this year the United States was shorter of bituminous coal than it had ever been on June 1 in any year of which we have a record. We were far worse off than on June 1, 1917. We faced a very grave situation because the railways, disorganized by government control and the switchmen's strike, were unable to ship more than about 9,000,000 tons of bituminous coal per week, when the country needed 12,000,000 tons per week. However, under the newly enacted Esch-Cummins law, the Interstate Commerce Commission, in co-operation with the National Coal Association and the American Railway Association, put into effect some practical service orders which applied enough transportation service to the business of handling soft coal to fill up the deficit and to give consumers the reserve supplies they needed before winter and to restore conditions to normal.

"Through the advantage afforded by the Esch-Cummins law the country today, instead of facing national disaster, as it did in the beginning of the winter of 1917-1918, is back to normal conditions of bituminous-coal supply. Thus the Esch-Cummins law and the Interstate Commerce Commission have been subjected to the severest possible test of their efficiency in the face of a grave transportation emergency, and they have more than made good. Clearly, then, no more legislation is needed to protect the public against that kind of interruption in its coal supply.

"Now, the only other serious interruption to coal supply arises from strikes. This may come from strikes not in the coal industry at all, but among railway employes, dock men, truck drivers, etc., as well as among coal miners. So far there is no protection whatever to the public against that kind of interruption of its coal supply.

"The National Coal Association, by charter limitation, has nothing to do with labor matters or wage-scale negotiations in the coal industry and, therefore, as an officer of that association I shall make no comment whatever upon that phase of the coal situation or what ought to be done about it. But I do want to point out, as an individual consumer of coal, that my own individual supply for my house and for any business in which I might be interested is subjected to vital interruption in coal supply on account of strikes.

"As an individual consumer of coal, let me say, therefore, that with the legislation now on the statute books it is clear that no further law is needed for the control and regulation of the production and distribution of coal. If any legislation is needed to protect the public against deficiency in the supply from the mines, which, as I have pointed out, are so amply able to furnish currently all the coal needed, then it is legislation which will protect the public against the interruptions which come from strikes, whether they be at the mines, or on the railroads, or wherever they may be."

## Fuel and Transportation Discussed at Mechanical Engineers' Meeting

THE forty-first annual meeting of the American Society of Mechanical Engineers was held in the Engineering Societies Building, 29 West 39th Street, New York City, Dec. 7 to 10. About 3,000 engineers, economists and educators were in attendance at the various sessions.

The general theme of the meeting was the conservation of fuel and the improvement of transportation. This, of course, emphasized the importance of those sections which devote their attention to fuels and railroads. Four papers were presented before the Fuels section. These were: "The Fuel Supply of the World," by L. P. Breckenridge; "Fuel Conservation; The Need for a Definite Policy and Its Requirements," by D. M. Myers; "Distillation of Fuels as Applied to Coal and Lignite," by O. P. Hood, and "Form Value of Energy in Relation to its production, Transportation and Application," by Chester G. Gilbert and Joseph E. Pogue. Abstracts from some of these papers will be printed soon in *Coal Age*.

Probably the most sensational paper presented was that of Mr. Myers. He stated that changes could be made through the application of well-known but commonly neglected engineering principles, which would save at least $450,000,000 per year in the nation's expenditures for coal. The coal actually savable would equal one and one-half times the freight-carrying capacity of the Pennsylvania R.R. lines east of Pittsburgh. The conservation of this fuel would release 75,000 miners to other productive employment or permit them to produce the ever-increasing supply of coal demanded by industry.

Prof. Breckenridge showed that North America was the most favored of all continents and the United States the most fortunate of all the nations of the earth in the matter of fuel reserves. He stated, however, that although our stores of fuel were still large, increase in consumption had been so rapid that the time appeared to be ripe for "co-operation in conservation."

Mr. Hood stated that while low-grade fuel, such as lignite, could be greatly improved by distillation, this process being accompanied by the extraction of numerous valuable by-products, it probably would be vain to hope that a superior fuel could be produced at low cost. Mr. Gilbert and Mr. Pogue drew attention to the fact that the applicability of a certain form of energy to a certain purpose often dictated the employment of energy in that particular shape to the

exclusion of all others. Thus the ready applicability of electricity to certain heating processes often determined its use to the exclusion of, say, bituminous coal, which costs only a fraction as much per unit of heat.

Discussion following the presentation of the papers was long and animated, requiring the fuels section to sit two full sessions, or about six hours in all. Conservation of coal and heat was treated from many viewpoints. One of the speakers attacked the problem from the sensible ground of its utility. Why should we endeavor to save fuel? Was it to gain an immediate, tangible, financial advantage, or were we to conserve fuel in order that our descendents may be blessed with a fuel supply? It appears that the former is the only tenable proposition. Unless we ourselves may reap benefit from our efforts at coal saving, we are not warranted in making those efforts and may safely assume that future generations will be able to solve the problems of their age and time as past and present generations have solved or are solving theirs.

Interest manifested in fuel saving far exceeded expectations and plans are now being formulated for further papers and discussion at the spring meeting to be held at Chicago.

## Instead of Cancelling Order, Foreign Buyer Sues for Non-Delivery of Coal

NOT all claims for settlement in the backwash of the now historic splurge in coal exports of last summer arise from cancellation of orders and contracts by foreign buyers. On the other side of the fence are American export shippers who are being sued for failure to deliver and an interesting angle of this is described in a letter to Charles S. Allen, secretary of the New York Wholesale Coal Trade Association. Messrs. Haight, Sanford, Smith and Griffen have advised Mr. Allen as follows:

"One of our clients, a member of your association, last spring sold coal abroad and chartered steamers to carry out the sale. Practically all charters contain a provision "the act of God, the restraint of princes, rulers, people, etc., mutually excepted." Our clients had coal at their own mine which they could ship, but subsequent to the making of the charters the government introduced a permit system by which the railroads could deliver coal for export only if the shipper had obtained a permit for foreign shipment from the Interstate Commerce Commission. Our client was unable to obtain permits for two shipments and suits have been brough claiming demurrage and damages for breach of charter.

"The claim is made that the 'restraint of princes' clause applies only to matters at the port of loading. At a preliminary hearing the District Judge in Baltimore expressed grave doubts as to whether the defense was good. The trial will take place Dec. 17. The attorneys who are bringing the case themselves have more than sixty other pending cases awaiting the decisions in these and many other attorneys also have cases. We are told that the ship owners have combined to win their case, and feel that your attorneys and members may be interested to assist us."

## Permanent Injunction Against Indiana Fuel Board May Force Return of Fees

INDIANA'S state general fund may be forced to stand the shock of heavy drawing, should the Federal Court return a finding for the plaintiffs in the hearing for a permanent injunction to prevent the Coal Commission from carrying out its orders, thus divesting the coal body of any power in regulating the coal industry in Indiana. Should the commission be stripped of its power, coal operators and retail and wholesale coal dealers may insist that the state return to them money paid the commission as license fees and as tonnage fees on production.

Members of the State Board of Accounts who served on the commission were forced, under the provisions of the Coal Commission Act, to serve without additional compensation. But the salaries of clerks and other expenses to be paid out of the treasury will nearly deplete the finances.

Section 13 of the Special Coal and Food Commission Act, in addition to providing means for raising funds for carrying on the work of the commission, says: "The money so paid shall be used in paying the expenses of said commission, including salaries, compensation and expenses of the commissioners, agents, clerks, employees, special counsel and assistants, but if not sufficient for that purpose, there is hereby appropriated out of the treasury and out of the funds not otherwise appropriated a sum sufficient to pay all expenses."

Those who have been discussing the possibility of a refund of license fees have declared that out of the general fund will come the money for this purpose. In fact, unofficial opinion from those who are in a position to interpret the act have been to the effect that this is the only place whence the money can come.

## New York Public Utilities Well Supplied with Coal

PUBLIC utilities in New York City, including railroads, street railways, gas, electric and steam companies, had on hand Dec. 6, 1920, 358,762 tons of bituminous coal. This is all used for steam and power purposes only, and does not include coal used in the manufacture of gas.

According to the Public Service Commission this statement reflects much better conditions than prevailed in the fall of the year.

Of bituminous coal the Brooklyn Rapid Transit Co. had twenty-one days' supply; the Interborough Rapid Transit Co., nine days' supply; the Richmond Light & Railroad Co., six days' supply; the New York Steam Co., sixty-two days' supply; the New York Edison Co., including the United Electric Light & Power Co., thirty-three days' supply; the Brooklyn Edison Co., forty days' supply; the electric department of the Flatbush Gas Co., fifty-two days' supply; the Queensboro Gas & Electric Co., eighty-four days' supply; the Bronx Gas & Electric Co., nine days' supply; the Kings County Lighting Co., forty-four days' supply; the New York & Richmond Gas Co., fifteen days' supply; the Brooklyn Borough Gas Co., 105 days' supply; the Brooklyn Union Gas Co., twenty-six days' supply.

In addition, the various companies have supplies of anthracite coal used for making gas. According to the same report the Queensboro Gas & Electric Co. had enough anthracite coal on hand for 163 days, the Bronx Gas & Electric Co. enough for 114 days, the Kings County Lighting Co. enough for twelve days, the New York & Richmond Gas Co. enough for eight days, the Consolidated Gas Co. enough for fifty-nine days, the Brooklyn Borough Gas Co. enough for thirty-nine days and the Brooklyn Union Gas Co. enough for twenty-two days.

Some of the companies also report supplies of bituminous gas coal over and above the bituminous coal used for steam and power purposes. Of this kind of coal the Queensboro Gas & Electric Co. has three days' supply and the Consolidated Gas Co. has thirty days' supply.

## Decrease in Season's Loadings Shown as Lake Shipping Closes

THE Hocking Valley docks at Toledo, Ohio, loaded 4,008,112 net tons of coal for shpiment to the Northwest, according to a recent report following the formal closing of the season, Dec. 7. During the week ended Dec. 4 the loading machines handled 106,260 tons, as compared with 99,543 tons the previous week, while 15,349 tons were loaded from Dec. 4 to 7. Compared with 1919, the record for 1920 represents a decrease, although the season extended more than two weeks later than last year. During 1919 the docks loaded 4,247,524 tons, which was transported in 83,024 cars. Coal handled in 1920 was transported in 74,313 cars.

During the week ending Dec. 4 the T. & O. C. docks at Toledo loaded 39,016 tons, as compared with 25,449 tons the previous week, making 1,783,000 tons for the season, which had not closed on Dec. 8. In the season of 1919 these docks handled 1,193,626 tons and in 1918 a total of 2,124,696 tons.

## Palmer Notes Lower Bituminous Prices; Gougers To Be Prosecuted

ATTORNEY GENERAL PALMER in his annual report of the operations of the Department of Justice for the last year reviews the work of the department in prosecuting profiteering in coal. He notes that following negotiations of coal interests, including the National Coal Association, looking to reduction in prices, bituminous prices have progressively receded in various regions. He says, however, that any operators or dealers who persist in charging high prices will be prosecuted.

The Attorney General says that action of the department in prosecuting anthracite profiteering has been limited owing to decisions of the Pennsylvania courts adjudging the Lever Act, on which the cases are based, to be unconstitutional. The department, however, has appointed special assistants to negotiate with dealers and operators in the anthracite region, and he notes that they have appointed committees to discourage unreasonable prices by producers. Investigations are also being conducted to prevent dealers charging high prices in sales to consumers.

The Attorney General says the government has moved to dismiss the petition of the Arcadia Coal Co. and other coal companies of Kentucky who have sought to annul Interstate Commerce Commission orders for car distribution, but the case has not yet come up for hearing.

Referring to the 1919 coal strike Mr. Palmer says phases of ultra-radicalism appeared, but that Judge Anderson's injunction ended the strike and radical activities.

In its high-cost-of-living work under the Lever law he says the department obtained two sentences, nine indictments and two arrests in coal cases.

## Railroads Must Supply Adequate Equipment, Traffic Experts Contend

THAT the railroads must supply sufficient equipment to take care of the peaks of requirement seems to be the prevailing opinion among members of the Interstate Commerce Committees of Congress. The heavy losses suffered by the farmers because they could not move their grain promptly this year, as well as the losses occasioned to numerous industries because open-top cars were not available for commodities other than coal, have been brought vividly to the attention of members of Congress.

Other classes of common carriers and public utilities, it is pointed out, must provide for the peak load. Street railways must have enough cars to handle the traffic at the busiest hours of the day and enough cars to take care of holiday and excursion requirements. Electric-light plants must have the equipment necessary to supply power during the hours that the demand is greatest. That the railroads should be allowed to have only enough equipment to handle the average volume of business apparently will not be tolerated, even if it should be found necessary to add somewhat to freight rates in order to justify the additional investment which would be required.

Opposition to government regulation of the coal industry or restrictions on the exportation of coal was expressed by Representative L. S. Echols, of West Virginia in an interview with a representative of *Coal Age*. Mr. Echols represents in Congress one of the largest coal-producing districts in the country—the great Kanawha and New River fields. He considers adequate transportation facilities the only relief necessary in the present coal situation.

"I am opposed to government regulation of the coal industry," said Mr. Echols. "The blame for the present high prices is not chargeable to the operators, who are selling their coal for from $3.50 to $5.50 a ton. The addition in the cost to the consumers, some of whom are paying from $10 to $15 a ton, is not chargeable to transportation. I know of one small mine which is selling its entire product at $4.50 a ton. The jobbers, brokers and scalpers are responsible for the high prices, and they should be forced out, when prices to the consumer would go down. The only relief in the situation is through added transportation facilities, and competition will normally reduce the price of coal. If they get the transportation the operators can produce from 25 to 50 per cent more coal than the consumers require. The exportation of coal should not be stopped."

## Wants Navy to Have Permanent Authority To Commandeer Fuel Supplies

IN his annual report Josephus Daniels, Secretary of the Navy, says that during the last year the navy expended $9,115,500 for 1,545,000 tons of steaming coal at an average cost of $5.90 per ton (gross at mines, it is assumed) and $382,500 for 45,000 tons of anthracite at an average cost of $8.50 per ton.

The Secretary of the Navy, in discussing the oil shortage, said it might be necessary to conserve oil for vessels by changing from oil to coal those industrial plants which have adopted oil burning. Oil required for the navy is increasing as coal-burning vessels are replaced by modern battleships burning oil, which is necessary for long voyages and cheaper operation.

He recommends that permanent authority be given the Navy Department to commandeer fuel supplies, including coal. He declares that exorbitant prices were demanded of the navy for coal, which made it necessary to resort to commandeering orders to obtain coal supplies for the navy at reasonable rates. Although repeated efforts were made to obtain supplies of coal through competitive bidding the quantities offered were not sufficient and the prices were excessive. The only alternative was to continue commandeering orders. While reasonable compensation governed the determination by the navy of the prices paid the Secretary says that the contractor who may consider the price inadequate has recourse to the law.

THE U. S. SUPREME COURT on Dec. 6 dismissed the application for review of the case of the Producers Coke Co. vs. the McKeefry Iron Co., in which the coke company was assessed damages for failure to deliver under contract coke to the iron company, due to car shortage.

IN THE CASE of the Wilbur Lumber Co. and F. C. Mintzlaff vs. the Director General, a tentative report of an examiner to the U. S. Supreme Court recommends that combination rates on coal from Illinois, Indiana, Kentucky and Eastern mines to points in Illinois and Wisconsin, which were subjected to the so-called double advances, are not unreasonable or discriminatory and that the complaints be dismissed.

## Estimated Bituminous Output, September, October, and First Ten Months, 1920*

(In Net Tons)

| State | September | October | Total first ten months, 1920 |
|---|---|---|---|
| Alabama | 1,359 000 | 1,568,000 | 15,197,000 |
| Arkansas | 188,000 | 210,000 | 1,941,000 |
| Colorado | 854,000 | 869,000 | 7,852,000 |
| Illinois | 8,074,000 | 9,009,000 | 76,633,000 |
| Indiana | 2,395,000 | 2,622,000 | 20,925,000 |
| Iowa | 688,000 | 817,000 | 7,554,000 |
| Kansas | 532,000 | 631,000 | 5 507,000 |
| Kentucky | 2,826,000 | 2,851,000 | 26,551,000 |
| Maryland | 295,000 | 292,000 | 3,313,000 |
| Michigan | 115,000 | 117,000 | 1,189,000 |
| Missouri | 478,000 | 485,000 | 4,795,000 |
| Montana | 375,000 | 457,000 | 3,901,000 |
| New Mexico | 297,000 | 302,000 | 2,873,000 |
| North Dakota | 62,000 | 74,000 | 596,000 |
| Ohio | 4,182,000 | 4,268,000 | 36,702,000 |
| Oklahoma | 302,000 | 338,000 | 3,316,000 |
| Pennsylvania (bituminou ) | 15,042,000 | 15,842,000 | 133,749,000 |
| Tennessee | 490,000 | 586,000 | 5,431,000 |
| Texas | 100,000 | 113,000 | 1,244,000 |
| Utah | 449,000 | 455 000 | 4,775,000 |
| Virginia | 724,000 | 743,000 | 7,915,000 |
| Wa hington | 294,000 | 354,000 | 3,024,000 |
| West Virginia | 8,003,000 | 8,027,000 | 70,819,000 |
| Wyoming | 939,000 | 1,002,000 | 8,377,000 |
| Other States† | 9,000 | 11,000 | 104,000 |
| Tota' bituminous | 49,172,000 | 52,143,000 | ‡454,283,000 |

*Prepared by F. G. Tryon and based on railroad shipments and subject to material revision.

†Includes California, Georgia, Idaho, North Carolina, Oregon and South Dakota.

‡As these State estimates are calculated in a slightly different way from the weekly estimate for the country as a whole, the cumulative totals differ slightly from those published elsewhere.

## Loaders and Mine Accidents Discussed by Institute Held at Wheeling

THE thirty-third session of the West Virginia Coal Mining Institute was held in Wheeling, W. Va., on Tuesday and Wednesday, Dec. 7 and 8. It was one of the most interesting of any held by this institute in a number of years, but, unfortunately, it was attended by few mining men, though there was no dearth of salesmen representing various companies manufacturing mining machinery. The sessions were held in the auditorium of the Wheeling Chamber of Commerce.

The morning session opened with an address of welcome from Mayor Thoner. Following this short formality the meeting adjourned in the hope that more would be present after dinner. In the afternoon an exceedingly interesting and instructive paper was read by G. C. McIntosh, the editor of *Solvay Folks*, Huntington, W. Va. Following this address, A. B. Benedict, engineer of the Goodman Manufacturing Co., read a paper on scraper loaders, in which he divulged some valuable information as to the cost of their operation in various mines in West Virginia.

Dean C. R. Jones of West Virginia University, at Morgantown, read a paper on "Some Phases of Mining Education," in which he outlined the courses that are now being given at the university for the education of mining engineers. He also described the vocational work that the university is doing throughout the state, calling the attention of the institute to the appropriations that were to be made for carrying on this work. The suggestion was offered that a committee be appointed to carry to the Legislature the recommandations made at this session.

The meeting then adjourned until 7 p.m. to meet at a banquet at the Hotel McLure. Too much credit cannot be given to the entertainment committee for its excellent menu and service and for the entertainment which "Riley" Wilson furnished the guests.

As the Coal Mining Institute of America was to hold its banquet on Wednesday night at Pittsburgh and many desired to be present, it was decided that the institute continue in session on Wednesday until the program was finished. This would permit the members who so desired to leave Wheeling to attend this banquet.

The first paper of the second day's session was by D. J. Parker, engineer in charge of the mine-rescue work of the Bureau of Mines at Pittsburgh, Pa., his subject being "Value of Oxygen Breathing Apparatus in Mine-Rescue Work." Mr. Parker pointed out that standardization in instruction was absolutely necessary, as serious results might happen where men were trained in different systems. He also pointed out that because a man stood up well in his tests did not mean that in case of an accident he would be a good helmetman, as often, no matter how well trained a man may be, he will lose his self-control and thereby endanger himself and the rest of the rescue party.

Robert Lambie, chief of the Department of Mines, Charleston, W. Va., then read a paper on the "Prevention of Mining Accidents," and George F. Dillig, of Pittsburgh, described the operations and construction of the Dillig loading machine, which is a development that promises to solve some of the problems that have been encountered in the design of this type of machine. Important features of this loader are that it has a caterpillar tractor to propel it from place to place and also that it has and needs no device to pick up the coal and deliver it to the conveyor, as the machine can bury itself in the material it is loading.

After the discussion of this paper J. F. Joy, the inventor of the Joy loading machine, gave a demonstration of a model of his loading machine.

The session closed with a business meeting, the officers for the next year being as follows: J. W. Bischoff, president; R. F. Carson, first vice-president; E. D. Knight, second vice-president; E. E. Jones, third vice-president; W. A. Craven, fourth vice-president; Joseph W. Reed, fifth vice-president; R. A. Sherwood, secretary-treasurer; the executive board consisting of J. R. Cameron, Frank Haas, James Paul and Joseph Keely.

## Efficient Transportation Indispensable to National Prosperity, Willard Says

DANIEL WILLARD, president of the Baltimore & Ohio Railroad Co., in an address on "1920—The Record Railroad Year," before the fourteenth annual convention of the Association of Life Insurance Presidents in New York City on Dec. 9, dealt at some length with the experience of the railroads since their return to private control on March 1 of this year. After saying that if our country is to enjoy commercial, industrial and domestic prosperity it must have an adequate and efficient system of transportation and that the most generally satisfactory and efficient agency so far developed is the steam railroad, Mr. Willard said that it is as certain as anything that the demand for rail transportation will greatly increase and on that account large capital expenditures, probably exceeding in the aggregate $1,000,000,000 each year, must be made for additional facilities and equipment.

He said that the most recent statistics available show that the steam railroads in the United States move on the average 4,000 tons one mile per capita per annum for our entire population, while previous to the war the average tonnage per capita per annum moved by the railroads in the five largest European countries was less than 400 per mile.

Referring to the matter of freight rates and saying that it has been clearly demonstrated by the conditions during the last twelve months that the transportation rate has little significance in affecting the ultimate price of an article transported when compared with the indirect cost which would result from inadequate transportation, Mr. Willard spoke as follows:

"The price at which soft coal has been selling at times and places during the last six or eight months is a case in point. It is estimated that we have in this country in the ground upward of a thousand billion tons of good bituminous coal, and we have a productive capacity actually developed capable of producing 15,000,000 to 18,000,000 tons per week, equal to 750,000,000 tons a year, but we have never in any one year consumed more than 560,000,000 tons. With this condition actually existing we have seen coal selling at prices from three to five times higher than normal, largely because the railroads were unable to transport the coal with promptness and reliability from the point where it could be produced in almost unlimited quantity to the point where it was required."

# Calder Report Advises Legislation Governing Quality, Production, Distribution and Price of Coal

LEGISLATION to check irregularity of delivery, inferior quality of coal, profiteering and monopoly of transportation facilities, is recommended by the Senate Committee on Reconstruction and Production in a preliminary report to the Senate Dec. 13. The committee also advocates that coal operators, wholesalers, jobbers and retailers be compelled by law to file with a federal agency reports on tonnage produced or handled and prices. The report recommends that a check be placed on the issuance of priority orders by the Interstate Commerce Commission on the ground that they offer opportunity for profiteering.

The committee declares that coal profiteering has been a national disgrace, "and that it is the duty of the government to take steps to remedy the evil." Government regulation, however, should be a last resort. The coal situation is scored by the three Senators making the report—Calder, of New York; Edge, of New Jersey, and Kenyon, of Iowa—in statements of their individual views given out simultaneously with the committee's preliminary report. Senator Calder declares that profiteering has been rampant and must be eliminated. He says the committee will soon present and urge favorable action upon measures in line with its recommendation. Senator Edge of New Jersey suggests revision of the Interstate Commerce law by transferring judicial powers of the Interstate Commerce Commission to the courts and its administrative powers to some agency to be established. He suggests a fuel division and a transportation division in the Department of Commerce to enforce observance of coal contracts and to cure the reconsignment evil. Senator Kenyon says Congress has power to prevent "this continuous plundering of the people" and declares that if present conditions continue he will favor the government taking over the coal mines.

The text of the coal section of the report is as follows:

"National development depends upon an ever-increasing supply of power. Heat is as necessary for production—in fact, for human existence—as is air or water. Its use must be continued from day to day and cannot be deferred or interrupted.

"The nation is dependent upon coal as its chief source of heat and power, yet the production and distribution of coal are badly organized and subject to manipulation at the expense of the people. Coal profiteering, especially as it has followed the priority orders issued by the Interstate Commerce Commission, has continued unchecked by the Department of Justice and is a national disgrace. Coal speculation has been permitted to monopolize the transportation facilities of the country, retarding necessary construction and increasing the basic cost of manufacture and distribution of commodities in general. It has bled the home owners, public utilities and the industries.

### Contract Breaking Arraigned

"The imperative necessity of continuity of supply of fuel demands the fulfillment of contractual relations in this industry more than in any other, and yet one of the primary causes for the disgraceful and disastrous conditions during the last six months has been the repudiation of contracts. An exceptional demand not only brings about reckless and unwarranted repudiation of contracts made for delivery of coal but the substitution of inferior quality at higher prices. Indeed coal contracts are so drawn as to be breakable in delivery, in quality and invoice.

"Our investigation into the coal situation has convinced us that the private interests now in control of production and distribution of coal, in spite of efforts by some, are actually unable to prevent a continuance or a repetition of the present deplorable situation and that it is the duty of the government to take such reasonable and practical steps as it may to remedy the evil.

"An inherent responsibility of the government is the protection of its people. To assure the mining, transportation and distribution of coal at fair prices is a public duty from which the government cannot escape. But

# Bids Submitted on Shipping Board Coal Requirements for 1921-22

## NEW YORK

**Total required, 900,000 gross tons**

| Company | Quantity | Pools | Price Bid 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Pennsylvania Fuel Co... | 150,000 | 10, 11, 71 | ..... | 9.93 | 9.93 | .... |
| Universal Transportation Company..... | 300,000 | ..... | ..... | 10.25 | ..... | 9.00 |
| Ainsworth Coal and Iron Company..... | 900,000 | 10 | 9.85 | 10.88 | 9.625 | 9.95 |
| L. Stern..... | 240,000 | ..... | ..... | ..... | 8.64 | .... |
| Geo. D. Morris & Co.... | 48,000 | ..... | 7.55 | 7.04 | 6.97 | .... |
| H. B. W. Haff..... | 50,000 | ..... | ..... | ..... | ..... | 9.50 |
| Commercial Coal Co.... | 60,000 | 10 | ..... | 10.35 | ..... | 9.20 |
| Commercial Coal Co.... | 40,000 | 9, 71 | ..... | 10.55 | ..... | 9.40 |
| Commercial Coal Co.... | 60,000 | 2, 9, 10 | ..... | 10.05 | ..... | 8.90 |
| Commercial Coal Co.... | 30,000 | 10 | ..... | 10.75 | ..... | .... |

## NORFOLK

**Total required, 480,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| Lake & Export Coal Corporation..... | 240,000 | 1, 2, 42 | ..... | ..... | 9.00 | .... |
| Maryland Coal and Coke Company..... | 480,000 | 1, 2 | ..... | ..... | 8.75 | .... |
| Universal Transportation Company..... | 480,000 | ..... | 8.95 | 10.45 | 8.65 | 8.95 |
| Central Pocahontas Coal Company..... | 240,000 | 1, 2 | 10.46 | ..... | 10.16 | .... |
| W. C. Atwater, Inc..... | 120,000 | 1, 2 | ..... | ..... | 9.35 | .... |
| Fort Dearborn Coal & Export Co..... | 60,000 | ..... | ..... | ..... | 10.00 | .... |
| Chesapeake & Ohio Coal & Coke Co..... | 18,000 | ..... | ..... | ..... | 10.00 | .... |

## BALTIMORE

**Total required, 240,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| W. H. Bradford & Co.... | 180,000 | 9, 10, 11 | ..... | 9.46 | 8.21 | 8.56 |
| Maryland Coal & Coke Company..... | 240,000 | 4, 9, 10, 11 | ..... | ..... | 8.20 | .... |
| Universal Transportation Company..... | 240,000 | ..... | 8.70 | 9.80 | 8.35 | 8.70 |
| L. Stern..... | 240,000 | ..... | ..... | ..... | 8.00 | .... |
| Jewett, Biglow & Brooks | 30,000 | 9, 10, 11 | ..... | ..... | 8.60 | .... |
| Geo. D. Morris & Co.... | 48,000 | ..... | 7.55 | 7.04 | 6.97 | .... |

[1]Trimmed in bunkers U. S. Shipping Board's ships (owned or controlled) taken under the chutes at the wharves or piers of the supplier, in lots as required.

[2]Trimmed in bunkers U. S. Shipping Board's ships (owned or controlled) at anchor within harbor limits, from supplier's lighters or barges, in lots as required or,

[3]F.O.B. (under chutes at wharves or piers).

[4]F.A.S. (ships at anchor within harbor limits from supplier's lighters or barges).

**PHILADELPHIA**

**Total required, 180,000 gross tons**

| Company | Quantity | Pools | Price Bid 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| G. Patchel & Co. | 180,000 | 4, 10, 11 | ..... | ..... | .7.99 | 9.07 |
| Courtright, Demmick & Company | 180,000 | 10, 11 | 8.85 | 9.63 | 8.55 | 8.78 |
| Maryland Coal & Coke Company | 180,000 | 4, 9, 10, 11 | ..... | ..... | 8.28 | .... |
| Universal Transportation | 180,000 | ..... | 9.70 | 9.80 | 8.35 | 8.70 |
| Ainsworth Coal and Iron | 180,000 | 9, 10 | 9.85 | 10.88 | 9.625 | 9.95 |
| L. Stern | 180,000 | ..... | ..... | ..... | 8.07 | .... |
| Jewett, Biglow & Brooks | 30,000 | 9, 10, 11 | ..... | ..... | 8.60 | .... |
| Geo. D. Morris & Co. | 48,000 | ..... | 7.55 | 7.04 | 6.97 | .... |

**NEW ORLEANS**

**Total required, 125,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| L. Stern & Co. | 125,000 | ..... | ..... | ..... | 7.45 | .... |
| Chas. Allan & Co. | 50,000 | ..... | 8.53* | ..... | 8.43 | .... |
| New Orleans Coal Co. | 125,520 | ..... | 11.50 | 11.00 | 11.25 | 10.75 |
| W. G. Coyle & Co. | 125,000 | ..... | ..... | 11.75 | ..... | 11.20 |
| Hyams Coal Co. | 120,000 | ..... | ..... | ..... | 9.05 | .... |

*10c. additional overtime work in Alabama mines.

**CHARLESTON**

**Total required, 50,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| L. Stern & Co. | 50,000 | ..... | ..... | ..... | 8.40 | .... |
| U. S. Fuel Corporation† | 50,000 | ..... | ..... | ..... | ..... | .... |
| Petros Coal Co. | 10,000 | ..... | ..... | ..... | 9.15 | .... |
| Taggert Coal Co. | 50,000 | ..... | 9.55 | 12.55 | 9.25 | 10.00 |
| Ship Rode Coal & Timber Mfg. Co. | 50,000 | 1, 2, 4 | ..... | ..... | 8.90 | .... |

†$10.50 per ton f.o.b. mines

**MOBILE**

**Total required, 50,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| L. Stern & Co. | 50,000 | ..... | ..... | ..... | 6.90 | .... |
| Charles Allan & Co. | 50,000 | ..... | 7.98 | ..... | 7.88 | .... |
| Horace Turner | 50,000 | ..... | 10.35 | 10.75 | ..... | .... |
| Horace Turner‡ | 50,000 | ..... | 9.35 | 9.35 | ..... | .... |
| Mobile Coal Co. | 50,000 | ..... | 10.50 | 11.22 | 10.10 | 10.74 |
| Southern Coal Co. | 49,992 | ..... | 8.75 | ..... | 10.25 | .... |
| Gulf Coal Co. | 53,000 | ..... | 8.85 | 9.60 | 8.45 | 9.20 |
| Gulf Coal Co. | 50,000 | ..... | 8.00 | 8.75 | 7.60 | 8.55 |

‡Alabama coal

**SAVANNAH**

**Total required, 40,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| L. Stern & Co. | 40,000 | ..... | ..... | ..... | 7.70 | .... |
| Petros Coal Co. | 10,000 | ..... | ..... | ..... | 9.30 | .... |
| Taggert Coal Co. | 40,000 | ..... | 9.95 | 10.77 | 9.80 | 10.00 |
| Standard Fuel Shipping. | 50,000 | ..... | ..... | 9.64 | ..... | .... |
| Godley & Griffen | 40,000 | ..... | ..... | 12.10 | ..... | .... |

**JACKSONVILLE**

**Total required, 40,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| L. Stern & Co. | 40,000 | ..... | ..... | ..... | 8.25 | .... |
| Jewett, Biglow & Brooks | 40,000 | ..... | ..... | ..... | 8.75 | 10.50 |
| Southern Coal Co. | 40,000 | ..... | 11.89 | 11.64 | 11.44 | 11.24 |
| Southern Coal Co.¶ | 40,000 | ..... | 11.35 | 13.00 | 12.85 | 12.60 |
| Logan Coal & Supply Co. | 40,000 | ..... | 9.45 | 10.95 | 9.00 | 10.45 |
| Petros Coal Co. | 15,000 | ..... | ..... | ..... | 9.40 | .... |

¶Pocahontas coal

**BOSTON**

**Total required, 30,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| Maritime Coaling Co. | 100,000 | ..... | ..... | 15.00 | ..... | .... |

**SYDNEY, NOVA SCOTIA**

**Total required, 30,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| Johnson & Co. | 20,000 | ..... | ..... | ..... | 10.25 or 10.00 | .... |
| Chesapeake & Ohio Coal | 2,500 x 12 | ..... | 10.25 | ..... | ..... | .... |

**GALVESTON**

**Total required, 25,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| L. Stern & Co. | 25,000 | | | | 11.00 | .... |

**TAMPA**

**Total required, 24,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| L. Stern & Co. | 24,000 | ..... | ..... | ..... | 10.75 | .... |

**PENSACOLA**

**Total required, 12,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| L. Stern & Co. | 12,000 | ..... | ..... | ..... | 6.90 | .... |
| F. Gillmore & Co. | 12,000 | ..... | 10.00 | ..... | 9.50 | .... |
| Hartwell & Lester, Inc. | 12,000 | ..... | ..... | ..... | 10.08 | .... |

**PORT ARTHUR**

**Total required, 8,000 gross tons**

| | | | | | | |
|---|---|---|---|---|---|---|
| LStern & Co. | 8,000 | ..... | ..... | ..... | 11.50 | .... |

your committee believes that governmental administration of the production and distribution of coal should be a last resort, as governmental activities should always be directed toward encouragement of private initiative and enterprise.

"While the fulfillment of contractual relations is of first importance to the stabilization of the industry in the interest of the consumer, the producer, and labor as well, your committee believes that the government should at all times be informed as to coal distribution and at this time recommends:

"That all coal operators, wholesalers, jobbers and retailers be compelled by statute to file at regular and frequent periods with some federal agency reports on the total tonnage produced or handled, the size and quantity thereof, the amount of tonnage contracted for, the amount sold on contract and at spot sale, to whom, together with the prices made or received under such contracts or sales, and producers and distributors to make regular reports sufficient to determine their costs and profits, and the corporate interrelations or the communities of interest, if any, between companies producing and distributing coal.

PERHAPS FEDERAL LICENSING

"With this and collateral information in the hands of federal authorities for possible use by the Department of Justice and other government agencies, prevailing evils as to irregularity in deliveries, inferiority of quality, profiteering in prices, and undue monopoly of transportation facilities should be to a great extent eliminated. But if no other remedy can be devised it may be necessary to enact some form of federal licensing to meet the situation. Fuel thrift by the small user and fuel thrift by the large user through storage, scientific combustion and transmission should be strongly encouraged by the federal government."

Senator Edward J. Gay, of Louisiana, a member of the committee, has announced that he will submit a minority report on the coal section of the committee's report. Senator Gay does not believe that the federal government should single out the coal industry nor should it require any private industry to submit reports of costs and profits or to be subjected to federal interference, such as the majority of the committee recommends.

## Supreme Court Notes

THE U. S. Supreme Court on Monday, Dec. 13, did not hand down its decision as to the constitutionality of the Lever fuel control law. The court will meet again Dec. 20 and then recess until Jan. 3.

The Court dismissed for want of jurisdiction the appeal of Truman A Ketchum, contesting title of the Pleasant Valley Coal Co. to Utah coal lands.

The Court denied an application for a review of the case of the Lambert Run Coal Co. vs. the B. & O. involving assignment of cars to mines.

# The Weather Vane of Industry

## News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

SLIGHT reactions from the business stagnation of the last two months is noted by such authorities as Babson, but Archer W. Douglas, vice-president of the Simmonds Hardware Co., of St. Louis is not so optimistic. Speaking before the Merchants Association of New York, Dec. 1, Mr. Douglas said:

"How long lack of demand will continue is beyond any man's ken even to state. My guess is it will last until the ultimate consumer, who has brought it about by ceasing to buy because of what he believes to be unduly high prices, makes up his mind that it is time to buy again; and I do not think he will make it up in a hurry.

"You can sell goods now at bargain prices but you cannot sell them at reasonably receding prices—just moderate recessions.

"I am afraid that it is going to last for some months at least, that we shall have a dull winter with more falls in prices and probably lessened production, for readjustment is a painful process. The question of production is, in industrial life, a thing now that need not concern us so much by its quantity as by its nature."

Those who believe as does *Coal Age*, that in the export market—for coal and other commodities—is our brightest prospect for next year will read with interest the comment from the *Financial Chronicle:*

"Europe is undoubtedly still in the market for large quantities of American commodities, but the apparent inability to formulate any comprehensive plan for financing foreign trade requirements and the gradual exhaustion of existing credit arrangements is making it impossible for American exporters and business men to continue their accommodations to needy European customers. In the opinion of some thoughtful observers, curtailment of exports under present conditions is not wholly an unfavorable symptom, since it is argued that the piling up indefinitely of huge debts by Europe is regarded as a hazardous if not actually dangerous procedure."

Meeting in Chicago this week are leading bankers of the United States formulating a plan for financing our foreign trade under the Edge law, in the expectation that the way will thus be opened for extending new credits and starting a renewed flow of our commodities to Europe.

### Textile Mills to Cut Wages

A wage reduction of 22½ per cent in textile mills in New England and New York State was forecast Dec. 9 in a statement issued after a conference of textile manufacturers in Boston. About 75 per cent of the industry in New England representing makers of cotton and woolen products was represented. The industry employs 300,000 operatives. The Erco Manufacturing Co., of Fall River, Mass., which employs 150 persons in making cotton waste products, announced a wage reduction of 15 per cent Dec. 9. The five cotton mills in Greenwood County, S. C., are now operating on full time after having curtailed production several weeks. With one exception the plants have day and night shifts. A 50-per cent cut in cotton production in 1921, through curtailment of the acreage planted to one-third of the total land in cultivation, was agreed on at a conference of Southern bankers, merchants and farmers, held in Memphis, Tenn., Dec. 8.

### Silk Mill Closes Indefinitely

Notices were posted Dec. 7 at the Standard Silk Mill, the largest mill in Phillipsburg, N. J., that beginning Dec. 8 the plant would be closed indefinitely. Market conditions are given as the cause. About 3,000 employees are affected.

### American Sugar Co. Cuts Wages

A reduction of 10 per cent in wages effective from Dec. 6 has been announced at the Jersey City plant of the American Sugar Refining Co. The reduction is said to be operative in all the Northern refineries of the company. Only 200 men are at work in the Jersey City plant, which in full operation employs 2,500 men.

### Ingot Production Declines

Steel ingot production during November, according to figures compiled by the American Iron and Steel Institute, amounted to 2,638,670 tons, a decline of 377,312 tons as compared with October, or about 12½ per cent. This production represents the output of thirty companies producing slightly more than 85 per cent of the total output of the country. For the eleven months of this year production has been 32,091,887 gross tons. No comparison is available with last year, as the institute failed to keep figures during the last three months of 1919 because of the disruption caused by the steel strike.

### Orders for Locomotive Company

The American Locomotive Co. has received orders for the following engines: The Missouri Pacific has ordered twenty-five engines of the Mikado type; Hetchy Railroad, one locomotive of the Prairie type; American Agricultural Chemical, one locomotive of the four-wheel switching make; West Pennsylvania Power Co., one four-wheel switching; Old Ben Co., two four-wheel switching locomotives.

### N. Y. Central to Close Toledo Shops

Closing of the Campbell shops of the New York Central near Toledo on Dec. 16 was announced Dec. 8 by George F. Wilson, general shop foreman. The closing will be for an indefinite period. More than 500 men will be out of work. Only car and engine repair crews will be maintained.

### Railroads Place Big Steel Orders

Orders for 388,000 tons of steel rails had been placed or were about to be given Dec. 7 by the railroads entering Pittsburgh. At the prevailing rate of $47 a ton the orders will total $18,236,000. The contracts include Baltimore & Ohio R.R., 85,000 tons, order placed Dec. 6; Pennsylvania R.R., 150,000 tons, contemplated; Pittsburgh & Lake Erie R.R., 15,000 tons, requisitioned; New York Central Lines, 135,000 tons, requisitioned; Pittsburgh & West Virginia Railroad Co., 3,000 tons, requisitioned. One of the railroad officials in Pittsburgh said that the big business of the nation in 1921 would come from the railroads.

# Foreign Markets and Export News

FRANCE is now the center of interest for the American export coal trade. This is true because of the slump in demand in that country brought about by causes similar in every way to those in the United States. Last summer foreign buyers were very much in evidence here seeking coal—today the American shipper is abroad seeking contracts for next year. In France, the nearest large market to England, will be fought out the first skirmish in the trade battle between English and American coal for the export market.

It is to Great Britain, therefore, that American exporters should turn instead of to France for the key to next year's business. The wholesale cancellation by the French of orders for American coal, of which the daily press has contained much news of late, are but the clearing away of the débris of the spree of the last six months. There is nothing more unusual in French buyers cancelling high-priced contracts in a rapidly falling market than in American consumers taking the same action.

Turning to Great Britain, we find that the national policy in coal contemplates the distribution of coal for the home market at less than cost of production, with a "standard profit" guaranteed the mine owner and the expectation that average realization on exports will make up the deficit on inland sales, pay the recent wage advance, cover the guaranteed profit and return a tax to the government. If export prices drop so low as to produce a loss for the industry as a whole, the government will of necessity render financial assistance.

It is evident that such a course cannot be pursued for long and that ultimately a readjustment will be made if necessary to keep the coal industry in Great Britain on a self-supporting basis. Against a mine cost in England of around $6@$6.50 per ton we have a *cost* at Hampton Roads of the same or a smaller amount. As far as competition with England is concerned the French market is ours only to the extent that the British have the coal and hold up the price.

Ocean freight is the variable that determines this. The differential against us to French Atlantic ports is too great for the United States to hold permanently any large share of French business, therefore what we get this next year will be what Great Britain and Germany cannot supply. There is a minimum quantity here the size of which no one can at present estimate, which must come from this side of the water. If that is sold today in a bearish market, it cannot be sold next summer when things look up again.

## Port of New York Exports Show Gain

There were 22,899 tons of anthracite shipped to foreign countries through the Port of New York in October. This was in comparison with 6,929 tons in the corresponding month of 1919; 11,656 tons in 1918, and 3,288 tons in 1917. Of the coal shipped France got 9,581 tons; Denmark, 5,209 tons; Norway, 2,682 tons. Canada secured 1,853 tons. Of the 71,665 tons of bituminous sent to foreign countries during the same month, 16,297 tons went to France and 34,521 tons to the Netherlands. Of the balance Egypt got 1,000 tons; Sweden, 6,985 tons; Portugal, 4,200 tons; Denmark, 4,528 tons, and Finland, 1,970 tons. Shipments of coke were 6,894 tons. Belgium received 1,202 tons; Finland, 2,200 tons, and Sweden, 1,636 tons.

## Freight Market Is Very Soft

According to W. W. Battie & Co.'s weekly coal trade report, the freight market on export coal to all destinations is very soft. Steamers are offered freely, with a scarcity of export orders. Freight rates by steamer follow:

| | Nov. 29 | Dec. 6 | Tons Discharged Daily |
|---|---|---|---|
| Malmo | About $9.50 | $8.00/ 8.50 | 1,000 |
| Copenhagen | About 9.50 | 8.00/ 8.50 | 1,000 |
| Stockholm | About 9.50 | 8.00/ 8.50 | 800 |
| Gothenburg | About 9.50 | 8.00/ 8.50 | 1,000 |
| Antwerp/Rotterdam | 6.75/ 7.00 | 5.00/ 5.50 | 1,000 |
| Hamburg | About 8.00 | About 6.50 | 1,000 |
| French Atlantic ex. Rouen | 7.00/ 7.50 | 5.50/ 5.75 | 700 |
| Algiers | 8.50/ 9.00 | 7.50/ 8.00 | 800 |
| West Italy | 8.50/ 9.00 | 7.50/ 8.00 | 1,000 |
| Marseilles | 8.50/ 9.00 | 7.50/ 8.00 | 1,000 |
| Piraeus | 10.50/11.00 | 9.50/10.00 | 1,000 |
| Trieste/Venice | 11.50/12.00 | 9.50/10.00 | 1,000 |
| Port Said | 10.00/11.00 | 9.00/ 9.50 | 1,000 |
| Constantinople | About 12.00 | 10.50/11.00 | 500 |
| Gibraltar | About 8.50 | 7.00/ 7.50 | 1,000 |
| Pernambuco | About 9.50 | About 8.50 | 500 |
| Bahia | About 9.50 | About 8.50 | 500 |
| Rio | 8.50/ 9.00 | About 8.00 | 750 |
| Santos | 9.00/ 9.50 | 8.25/ 8.50 | 500 |
| Buenos Aires, Montevideo or La Plata | 8.50/ 9.00 | About 8.00 | 500 |
| Para | 9.00/ 9.50 | About 8.50 | 500 |
| Rosario | 9.50/ 9.75 | 8.00/ 8.50 | 750 |
| To Nitrate Range | About 7.25 | About 6.50 | 500 |
| Havana | About 5.00 | About 5.00 | 500 |
| Sagua or Cardenas | About 6.00 | About 5.50 | 300 |
| Cienfuegos | About 6.00 | 5.50/ 6.00 | 500 |
| Caibarien | About 6.00 | About 5.50 | 300 |
| Guantanamo | About 6.00 | 5.50/ 6.00 | 500 |
| Manzanillo | About 6.50 | About 6.00 | 300 |
| Bermuda p. c. and dis. free | About 5.50 | About 5.00 | 300 |
| Kingston | About 7.00 | About 5.50/6.00 | 400 |
| Barbados | 6.50/ 7.00 | 6.00/ 6.50 | 500 |
| St. Lucia | 6.50/ 7.00 | 6.00/ 6.50 | 500 |
| Santiago | About 6.00 | 5.50/ 6.00 | 500 |
| Port of Spain, Trinidad | 6.50/ 7.00 | 6.00/ 6.50 | 500 |
| Curacao | About 6.50 | About 6.00 | 500 |
| Free p. c. Curacao St. Thomas | About 6.00 | About 6.00 | 500 |

HIGH PRICES OF steaming coals in foreign ports are adding heavily to the cost of operating American ships, according to advices received by the Universal Shipping & Trading Co. of Seattle. At Pernambuco, Brazil, and Callao, Peru, ships have to pay approximately $45 a ton for coal.

PERNAMBUCO RECEIVES its coal supplies from the North Atlantic ports of the United States while Callao gets its coal from Newcastle, Australia. Pernambuco is on the northeast coast of Brazil.

ACCORDING TO THE Universal Company's advices, the end of the coal strike in South Africa found Delagoa Bay and Durban filled with ships. Progress at present is slow in working off the volume of tonnage to the ports named.

OWING TO LOADING congestion, coal stocks in South Wales are excessive. Buyers holding loading berths are able to secure 10 to 15 shillings a ton concession. Otherwise prices are fairly well maintained.

GERMANY IMPORTED 18,500 tons of American coal from Oct. 10 to 24 of this year. Of this quantity, 7,800 tons went to the rubber industry, 6,200 to chemical works, 2,200 to the woodpulp industry, and the rest to miscellaneous works

## Final Statistics of Tidewater Movement of Coal for November, 1920

TIDEWATER dumpings during November fell below the 5,000,000-ton mark. The total dumped is reported to the Geological Survey at 4,784,000 net tons, a considerable decrease from the figures for October. The decrease was shared by all the ports, and the greatest shrinkage was in export shipments, which fell off 848,000 net tons, or over 29 per cent. New England shipments showed a decrease of 47,000 net tons, while tonnage for other purposes—bunker, inside Capes, and other tonnage—decreased 57,000 net tons.

TIDEWATER BITUMINOUS SHIPMENTS FOR NOVEMBER, AND TOTAL TONNAGE SHIPPED JAN. 1-NOV. 30, 1920

(In Thousands of Net Tons)

| Destination | New York | Philadelphia | Baltimore | Hampton Roads | Charleston | Totals |
|---|---|---|---|---|---|---|
| Month of November: | | | | | | |
| Coastwise to New England | 254 | 59 | 61 | 415 | 3 | 792 |
| Exports | 4 | 327 | 558 | 1,116 | 58 | 2,063 |
| Bunker | 421 | 61 | 68 | 302 | 10 | 862 |
| Inside Capes | ... | 182 | 108 | 20 | ... | 310 |
| Other tonnage | 673 | 2 | 9 | 67 | 6 | 757 |
| Totals | 1,352 | 631 | 804 | 1,920 | 77 | 4,784 |
| Jan. 1-Nov. 30: | | | | | | |
| Cumulative coastwise to New England | 2,463 | 725 | 700 | 5,715 | 7 | 9,610 |
| Exports | 17 | 2,563 | 4,699 | 12,250 | 720 | 20,349 |
| Bunker | 3,531 | 611 | 832 | 3,251 | 102 | 8,327 |
| Inside Capes | ... | 1,732 | 1,073 | 279 | 4 | 3,088 |
| Other tonnage | 7,335 | 16 | 41 | 674 | 34 | 8,100 |
| Totals | 13,346 | 5,647 | 7,345 | 22,269 | 867 | 49,474 |

The cumulative tidewater movement for the first eleven months of 1920 amounted to 49,474,000 net tons, of which 9,610,000 tons were destined for New England and 20,349,000 tons for foreign ports.

## Want Agreement Changed but Not Abrogated

THE parley between operators and miners of District 16, United Mine Workers, covering the Upper Potomac and Georges Creek fields, at Baltimore on Nov. 30, was of short duration, further conferences being postponed until Dec. 7, after the miners had presented their side of the case in written form requiring seven typewritten pages. While both sides maintain the utmost secrecy as to the gist of grievances of the operators, there is little doubt that the miners are seeking the "closed shop," a concession, from what can be learned, the operators are unwilling to make.

The agreement now in force and which the miners desire to have changed in some respects has been in effect since May 15, 1918. It is not the purpose of the miners, it is asserted, to reopen the present contract but rather to readjust, as they express it, the working conditions. Neither side appears to have any desire to discard the 1918 agreement, but the miners desire it changed.

There were two meetings at Baltimore at the time stated but neither lasted more than fifteen minutes. When the demands of the miners were handed to the operators their adoption was espoused by John P. White, at one time international president of the United Mine Workers.

## Production of Bituminous Increases in the Northern and Middle Appalachians

A SLIGHT increase marked production of bituminous coal in the Northern and Middle Appalachians during the week ended Nov. 27. The recovery doubtless would have been much more pronounced had it not been for the occurrence of Thanksgiving Day during the week. From reports of cars loaded, furnished by the American Railroad Association, the Geological Survey estimates the output in this region at 6,703,000 net tons, an increase of 76,000 tons, or slightly over 1 per cent, when compared with the preceding week.

WEEKLY PRODUCTION IN NORTHERN AND MIDDLE APPALACHIAN REGION *

(In Net Tons)

| | |
|---|---|
| 1920 weekly average, January-September | 6,076,000 |
| Week ended Nov. 6 | 6,670,000 |
| Week ended Nov. 13 | 7,280,000 |
| Week ended Nov. 20 | 6,627,000 |
| Week ended Nov. 27 | 7,703,000 |

* Including Ohio, Pennsylvania, Maryland, West Virginia, Virginia and Eastern Kentucky.

## Anthracite Operators Refuse Blanket Increase to Mine Workers

WHILE expressing a willingness to adjust any individual causes of injustice or inequality within the present agreement representatives of the anthracite mine operators notified the mine workers Dec. 8 that they were against granting any general additional wage increase or taking any action that would tend to reopen the award of the U. S. Anthracite Commission.

The attitude of the mine owners toward demands of the miners for general additional wage increases, a $6 minimum day labor rate and a universal eight-hour day for the anthracite mine workers was made known to the miners in Philadelphia late Dec. 8 at an executive session of the joint sub scale committee of the anthracite miners and operators, which had been holding almost continuous conferences for three days.

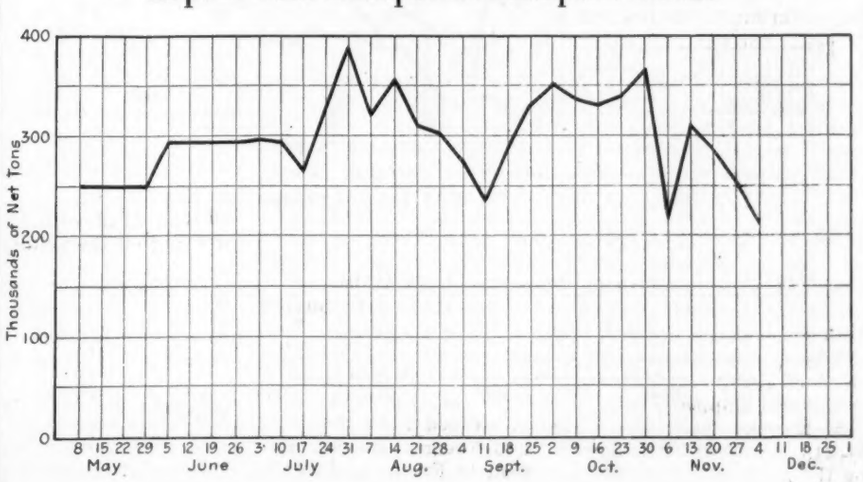
In addition to the offer to adjust alleged inequalities that may be mutually agreed upon, the operators also offer the eight-hour schedule to some of the long-hour men. There will be a reconvening of the joint scale committee as soon as the operators' representatives have made their report to the general scale committee.

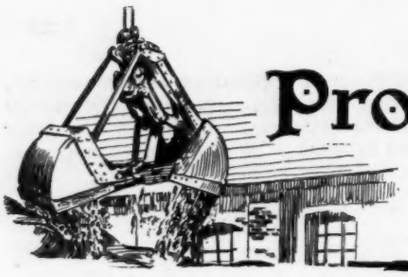
### Export Dumpings by Ports

(NET TONS)

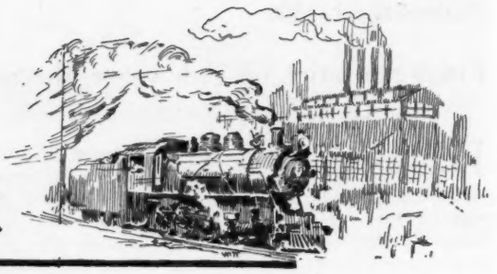
| | Week Ended Dec. 4 | Nov. 28 |
|---|---|---|
| Philadelphia | 61,000 | 62,000 |
| Baltimore | 82,000 | 69,000 |
| Norfolk | 223,000 | 257,000 |
| Charleston | 21,000 | 11,000 |
| Total | 387,000 | 399,000 |

### Export Coal Dumped at Hampton Roads





# Production and the Market



## *Weekly Review*

AN UNUSUAL rate of production in the face of a steadily declining market is the chief item of interest in the coal trade this week. This combination of conditions together with the extraordinary mild weather give rise to predictions that 1921 will see a repetition of those of last year when, following the armistice, the buying of coal was delayed and consumption was for a time largely out of accumulated stocks. The rate of production will go down just as soon as consumers in the aggregate have on hand sufficient supplies of bituminous coal to carry them through the winter, or until March or April 1. A careful survey of the data available on stock indicates that the supply above ground and in the hands of customers now is in excess of 40,000,000 tons, which with the lessened rate of consumption is certainly very nearly normal for this time of year.

Spot buying of bituminous coal is at a low ebb and the coal that is going forward day by day is in fulfillment of contracts made nearly a year ago. Already there are reports of numerous suspensions and hold-ups on these contracts, which clearly indicate that the certain decrease in production of the holiday weeks will cause no hardship among consumers. The all-important question now is whether demand will be resumed after the first of the year in a measure to be compared with that of today. There is nothing to indicate resumption of demand in the next thirty days sufficient to give new life to the spot coal market.

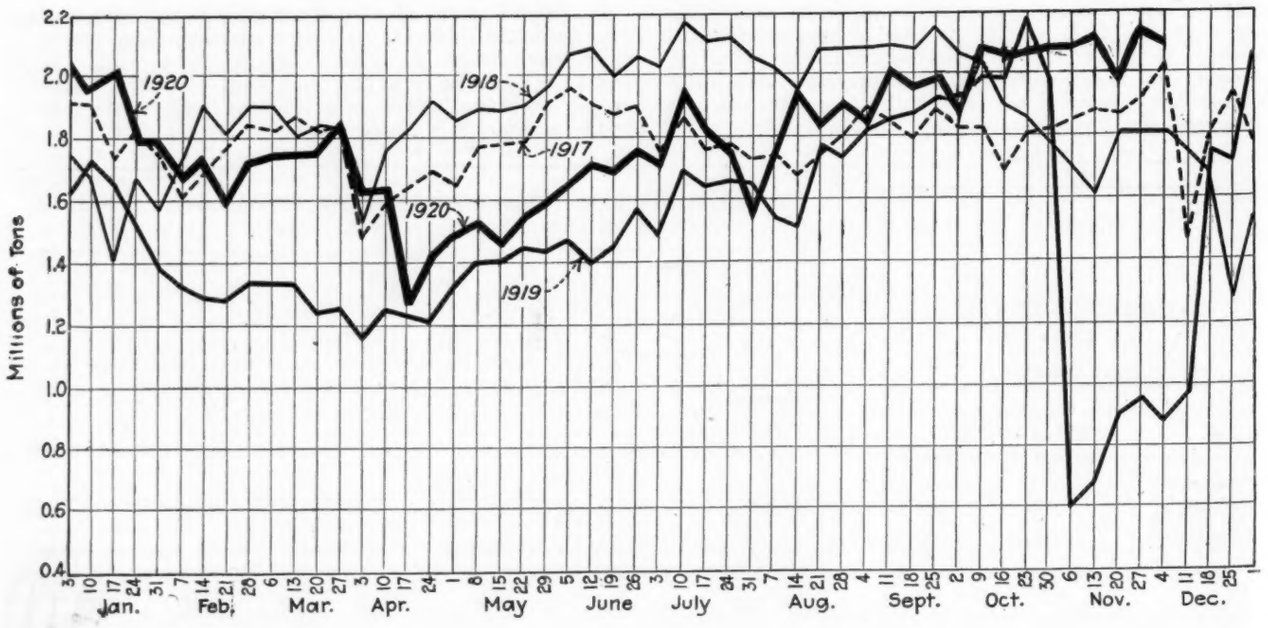
While shippers to American consumers are thus marking time the export market is undergoing serious readjustment. Lack of demand abroad and in New England for smokeless coal has resulted in heavy shipments in the Inland Western markets, where competition with Illinois and Indiana coal is forcing the prices of these coals to new low levels for the year.

There is this distinction, however, between the future of the foreign demand and that within the United States and Canada: Whatever the consumption of coal may be within the United States next year the supply must come from mines in this country. Abroad our producers and exporters must compete with increasing output in Germany and France and an increased supply in Great Britain in the hands of the most experienced exporters of coal in the world, determined to regain, as far as possible, markets lost during the war.

### BITUMINOUS

Record production of soft coal is reported by the Geological Survey for the week ended Dec. 4. The total output, including lignite and coal coked, is estimated at 12,757,000 net tons, the highest mark attained during the present season. Even heavier production was reported on Monday

### Average Daily Production of Bituminous Coal*




*From weekly report of Geological Survey.

and Tuesday (Dec. 6 and 7) due to excellent car placement. The year 1920 to date is about 33,000,000 tons behind 1918, but is 87,000,000 tons ahead of 1919 and is now within three and three-quarter million tons of 1917.

Car supplies are entirely adequate to move tonnage on present orders. The record production was made possible by the placement and loading of 232,340 cars during the first week of December, an achievement the more noteworthy because of the recent withdrawal of priority in the use of open-top cars for coal loading. A general shortage of equipment was experienced by West Virginia operations on the C. & O. due to poor and inadequate motive power. The eastern Ohio district supply continued short with a B. & O. placement of 65 per cent of capacity.

### Industrial Uncertainty Raises Labor Efficiency

Labor conditions continue to be generally satisfactory. The men are working steadily and it is plain that the unemployment ensuing from many industrial shutdowns has had a beneficial effect on efficiency of mining labor. Just now there is practically no idle labor, but losses are sure to occur from this source from the effect of Christmas and New Year "vacations." Operators are vitally interested in the plan to restrict immigration. If a ban is established they fear it will produce a shortage of common labor which will affect costs of production. Strikers are no longer a bar to Alabama coal production, as shown by late tonnage reports. More mines have resumed operations in the Williamson field of West Virginia and strikers' places are being steadily filled by labor enlisted from other fields. A committee of the strikers in the Georges Creek and Upper Potomoc fields has presented proposals to the operators which embody virtual recognition of the closed-shop principle. It is expected the operators will fight the closed shop to a finish.

Decline in the spot market continued, although the break last week was not so heavy. It is apparent that the decline has passed the point where profitable operation can be conducted by smaller producers with no contract affiliations and this is evidenced by a general closing down of such operations. Prices are nearing the bottom and much curtailment of operation may be expected before the business readjustment is completed. The steam market is now below the $4 level, with demand unimproved. Indiana operators are finding their State Commission price now compares favorably with outside market quotations. Domestic coal also is easier, the prolonged mild weather and unusually heavy shipments of prepared sizes having weakened this market and flooded the trade with screenings.

### Coal Buyers Now Insistent on Quality

High-grade steam fuels are moved without much difficulty, but many refusals have been heard of coal that is "off-color." One New England road recently refused a large consignment because of this complaint, and it is plain that shippers of medium and inferior grades will be the heavier losers from the present more discriminating market. Midwest markets are inactive and some railroads are seeking outright cancellation of contracts on the ground that the greatly lessened freight movement has curtailed their fuel requirements. With these factors and the closing of Lake navigation an increasing amount of free coal is being thrown on a quiet market.

The following table shows the trend in the spot steam market (mine run basis, net tons, f.o.b. mines):

| | Nov. 1919* | May 1920 | Aug. 5 1920 | Dec. 2 1920 | Dec. 9 1920 | Dec 16 1920† |
|---|---|---|---|---|---|---|
| Pittsburgh steam | $2.30 | $4.00 | $10.00 | $5.00 | $4.00 | *$3.75* |
| Pittsburgh screened gas | 2.30 | 4.50 | 12.00 | 5.50 | 4.75 | *4.50* |
| Hocking | 2.50 | 4.75 | 9.00 | 4.50 | 4.25 | *3.75* |
| Franklin, Ill | 2.35 | 3.75 | 6.50 | 5.00 | 5.00 | *4.00* |
| Indiana 4th vein | 2.35 | 3.40 | 7.50 | 4.00 | 4.00 | *3.25* |
| Eastern Ohio, No. 8 | 2.35 | 4.50 | 10.50 | 5.00 | 4.50 | *4.00* |
| Fairmont | 2.50 | 6.75 | 13.50 | 4.75 | 4.25 | *3.75* |
| Kanawha | 2.60 | 6.75 | 14.00 | 4.75 | 4.50 | 4.50 |
| S. E. Kentucky | 3.00 | 6.00 | 10.50 | 5.25 | 5.25 | *4.75* |
| Western Kentucky | 2.35 | 3.50 | 5.25 | 4.25 | 4.25 | *4.00* |
| Clearfield | 2.95 | 6.25 | 12.00 | 5.00 | 4.75 | 4.75 |
| Cambria and Somerset | 2.95 | 6.75 | 13.50 | 6.00 | 6.00 | 6.00 |
| New River, Pocahontas | 2.70 / 2.35 | 6.50 | 14.00 | 5.25 | 5.25 | *5.00* |

*Government prices.
†Advance over the previous week shown in **heavy type**, declines in *italics*.

Tidewater shipments during the week ended Dec. 5, as reported by the Geological Survey, amounted to 1,110,000 net tons, an increase of 76,000 tons as compared with the preceding week. Shipments to New England increased 23,000 tons and the combined tonnage for bunkering, inside capes and other purposes showed an increase of 65,000 tons. Exports declined about 11,000 tons. Foreign demand was at a low ebb and quotations as low as $12 c.i.f. French-Atlantic ports were reported. Refusal of tonnage due on some French contracts is causing heavy losses to American shippers and further depressing the export market. Quotations f.o.b. mines for immediate shipment overseas are fast approaching prices for home delivery.

The tonnage handled at Tide the week of Dec. 5 was destined as follows:

| Destination | New York | Philadelphia | Baltimore | Hampton Roads | Charleston | Total |
|---|---|---|---|---|---|---|
| Coastwise to New England | 58,000 | 25,000 | 10,000 | 106,000 | 2,000 | 201,000 |
| Exports | ..... | 61,000 | 82,000 | 223,000 | 21,000 | 387,000 |
| Bunker | 81,000 | 14,000 | 17,000 | 98,000 | 7,000 | 217,000 |
| Inside Capes | ..... | 42,000 | 28,000 | 8,000 | ..... | 78,000 |
| Other tonnage | 207,000 | ..... | 1,000 | 19,000 | ..... | 227,000 |
| Total | 346,000 | 142,000 | 138,000 | 454,000 | 30,000 | 1,110,000 |

New England all-rail movement increased 506 cars during the week ended Dec. 4, when 5,211 cars were forwarded through the five rail gateways. This is the largest week's shipment since that of Oct. 23, when 5,532 cars were forwarded.

### Close of Lake Traffic Shows Higher Receipts

Cumulative Lake movement for the season reached a total of 23,432,000 net tons cargo and vessel fuel, some 600,000 tons in excess of the movement for the season of 1919.

Receipts of soft coal on the Duluth-Superior docks are in the neighborhood of 7,000,000 tons. Mild weather and diversion of buying to the Illinois and Indiana all-rail fields have combined to avert any possibility of a serious fuel shortage in the Northwest this winter.

## ANTHRACITE

Production of hard coal, like that of bituminous, reached a new maximum for the year during the week ended Dec. 4. Cars loaded, as reported by the Geological Survey, numbered 39,214, indicating a total output of 2,051,000 net tons. This was an increase of 76,000 tons over the latest full-time week. Shipments to Eastern centers are steadily improving and already much of the insistent demand has ceased. The Chicago market also reports an increase in current receipts, although the supply is still below normal. Steam sizes are plentiful and independent quotations are generally down to company circular figures, while domestic prices also are weaker.

Conferences between representatives of the miners and operators show that while the latter are willing to adjust any individual cases of inequalities, they will not consider any flat wage increase at this time because of the downward trend of all commodities and lowered cost of living.

## COKE

Beehive coke production increased slightly during the week ended Dec. 4, when 376,000 net tons were produced, according to the Geological Survey. This was an increase of 9,000 tons as compared with the preceding week and was caused almost entirely by greater activity in Pennsylvania and Ohio. Cumulative coke production for 1920 is now 19,569,000 tons, an increase over 1919 of 1,290,000 tons.

Softening of the spot coke market because of failing demand is having the natural result in the Connellsville region, that of restricting output. Many ovens have been put out and indications are that the number will be increased before the first of the year. Furnace interests are not yet curtailing their output, as the steel men are taking this opportunity to stock coke at point of consumption. The stagnant market is reflected in lowered prices; furnace is $7@$7.25 and foundry $8@$8.50. Contract negotiations for the first half of 1921 have not yet passed the preliminary stage, as producers and consumers are still far apart on price basis.

# Reports From the Market Centers

## New England

### BOSTON

*Much Coal Offered, but Few Sales—No Great Surplus of Better Grades—Receipts Continue Fairly Even—Hampton Roads Market Extremely Dull—Prices Show Little Change—Signs of Better Movement of Anthracite.*

**Bituminous** — The less favorably known coals from central Pennsylvania and West Virginia are being freely offered, but buyers show little or no response. The market is actually glutted with cheap grades and sooner or later there must be a decrease in production of this kind of fuel. Something over 300 cars have been rejected at the Hudson River gateways by one of the New England roads, desperate efforts to sell having been made both by the railroad and original shippers. Prices as low as $3 f.o.b. mines have been made, but consumers generally are so well stocked and have so little business in hand that sales are very few.

On the other hand, the choice grades are in fairly firm position. Most producers have a fair amount of contract business at prices that usually are below the current market level for similiar coals. This has a tendency to keep the coal moving, even though the consignee has accumulated ample reserves. There is still a feeling among conservative buyers that high grades will be as scarce as ever in the spring and that the new contract figures may be well in advance of those made last spring even with the wage increases that have since been added. There is certainly very little pressure needed to move best grades.

Receipts both by rail and water are maintained about at the level of November. This is a surprise to many, but it is quite likely that this month as a whole will show a decrease. Railroads are taking on less fuel than 30 days ago and since this has formed a large proportion of shipments all-rail it is clear that receipts generally are on the wane.

At all the Tidewater piers there is a lack of inquiry. At New York, Philadelphia, and Baltimore there is practically no inquiry for spot shipment coastwise, and at Hampton Roads the situation is only very little better. Dumpings for New England were at low ebb the week ending Dec. 4 and the export market is becoming increasingly inactive. The amount of cargo coal either at or enroute to European ports is understood to be very large and there have been liquidations that show tremendous losses. Several modern coal carriers that were built for the trade between Norfolk and Boston are back in the old channels, this being due largely to the slump in trans-Atlantic freights and the fact that oversea markets also are getting overstocked.

Current prices on bituminous at wholesale are about as follows:

| | Clearfield | Cambrias and Somersets |
|---|---|---|
| F.o.b. mines, per net ton | $4.00@5.50 | $5.00@6.50 |
| F.o.b. Philadelphia, per gross ton | 7.15@8.80 | 8.25@10.00 |
| F.o.b. New York, per gross ton | 7.60@9.25 | 8.70@10.50 |

On cars, Providence and Boston, Pocahontas and New River are quoted $13@$13.50.

**Anthracite**—There are signs that domestic sizes will soon be in much better supply. Several originating companies who have not been taking on business even from regular customers the past six months are now offering late December delivery.

Retail trade is falling off with the continued mild weather and unless we get much lower temperatures for long periods the saving in fuel this winter will amount to a very large tonnage. Cancellations are beginning to be frequent in the retail trade and it is generally conceded that we are very nearly over the hump.

## Tidewater East

### NEW YORK

*Further Improvement in Anthracite Situation—Receipts Increase Slowly—Shortage Reported from Nearby Small Towns—Steam Coal Receipts Increase—Bituminous Market Quiet—Demand Is Low—Loaded Boats Plentiful and Prices Are Lower.*

**Anthracite**—The local situation has eased considerably. Shipments are steadily increasing and a few weeks more of mild weather ought to find the supply in good shape. Reports from some of the small neighboring towns indicate a lack of coal, but there has been no suffering.

Some retailers are still without coal in their yards, deliveries to consumers being made direct from barges or cars. This condition exists more generally in Brooklyn than in Manhattan. With the tonnage increasing some consumers are willing to wait a few days longer if there is any prospect of getting the size ordered instead of taking substitutes.

Line trade demand continues strong with stove, nut and a good sprinkling of pea mostly wanted. Independent coals move quickly, but buyers are more conservative and delay considerably before closing sales. They are also refusing to take a portion of their order in buckwheat, unless it is absolutely necessary. Quotations for independent domestic are $10@$12, with most sales being made $11@$12.

Steam supplies are becoming larger, due in part to the low prices at which bituminous can now be gotten. Best grades of independent buckwheat are being quoted around $4.50 while some qualities are being offered as low as the regular company schedule of $4.10. Rice coal is quoted $2.75@$3, while some shippers were willing to let their supply of barley go at anything from $1 up.

**Bituminous**—Continued depression in business has caused a further lowering of prices. On all sides one hears of "no business" but there is much optimism among the trade.

The reports heard here of French firms refusing to pay for American coals shipped to France are being borne out in newspaper dispatches. Some shippers are facing large losses. Foreign shipments from this port are much smaller.

Local houses are in receipt of many cancellations or requests to hold up shipments until business improves. This has resulted in many shippers finding themselves with a cargo or two of spot coal on their hands for which they must find a buyer.

The larger supply of coal is reflected in the stocks of local public service corporations as of Dec. 6, they having at that time a total of 358,762 tons of steam and 69,386 tons of gas coal. Some of the companies have nearly two months supply on hand.

Quotations range $4.25@$4.75 for Pool 10 at the mine; $4.75@$5.25 for Pools 9 and 71, and $3.50@$4 for Pool 11. Prices at the local piers are on the above basis.

Loaded boats are plentiful and some low offers are reported. Stocks at the piers were not large but this was said to be due in part to the loading of boats which were afterwards anchored near by. Pool 10 was quoted $8@$8.25 alongside while Pools 9 and 71 were 50c.@$1.25 higher. A cargo of Pool 34 was offered at $8.50 alongside.

### PHILADELPHIA

*Fair Anthracite Shipments Being Received — Retailers Strive To Avoid Credit—Miners Denied Wage Increase—Steam Sizes Weakening—Bituminous Fairly Firm—High Grades Only in Demand — Coal Accumulates at Tide — Export Inquiries Are Light.*

**Anthracite**—A moderate tonnage is still reaching this market. Naturally the best shipments are being made by the companies. Retailers report the demand fairly active, although much of the edge of the insistent call has worn off. Dealers have all received coal of the different sizes recently and most of them have sufficient stock to keep them going nicely.

There has actually been a feeling among retailers lately they they are not at all anxious to accumulate much stock. The public without a doubt has much less money to spend and many dealers are importuned to give credit to former cash customers. More than one dealer has been in a position to refuse this by the fact that he has had no coal for immediate delivery. Dealers are determined to protect themselves as the industrial situation is anything but promising.

One spot of uneasiness is that the operators recently denied miners any further increase in wages. Should the men determine to strike it would cause almost endless trouble, inasmuch as the yards contain very little in the way of stocks.

Retail prices remain unchanged, although radical increases made by some of the independents have cut severely into dealers profits. With the Western market about shut off it is a question how long the independents can maintain these prices, particularly should the weather continue mild.

Steam sizes are beginning to cause some shippers much uneasiness. Most independents are glad to be able to move their output at company prices, although a few still try to do a little better than $4.25 on buckwheat. Barley can be had in almost any volume at $1.50. The companies are now willing to accept new buckwheat business at the $4.25 rate, which indicates the changed conditions.

**Bituminous**—The trade has remained somewhat firm as compared with the previous week, yet many evidences of softening are still noticeable. Inferior grades have almost slipped out of the market, as the consumer when he does buy is inclined to pick good coal.

High grades have been freely offered, with the exception that Pool 1 has not been put on the market as extensively as others. This grade has been quoted quite firmly at $6, while the next best, Pool 9, is moved in fair volume at $5.25. While we believe the average price range on Pool 10 has been $4.50@$4.75, bona fide quotations of blocks at 50c. less are known. The same also applies to Pool 11, the general selling price of which has been $4@$4.25. Pool 18 when asked for by the consumer is quoted $3.50@$3.75, with little being sold. Pool 34 has been about $3.50 for mine run, $3.75 for screened and $3.25 for slack, with the demand somewhat weak.

The chief incident of the export trade has been the accumulation of coal at Tide. Due to some shippers having much coal on hand at the piers sales have been made around $2.75, plus reconsigning charges and demurrage. There is also reported quite a little coal standing at the piers below standard and this has caused shippers much trouble. Inquiries from abroad continue to decline.

**Coke**—The market is extremely quiet, due to curtailment in the iron trade. Connellsville foundry is $8@$8.50 and furnace $7.25@$7.50.

## BALTIMORE

*All Prices Are Lower — Export Movement Greatly Diminished — Foreign Bankers Blamed — Anthracite Receipts Are Entirely Adequate.*

**Bituminous**—The soft coal market is weak in all its phases. Prices are still declining and demand, especially for the poorer grades, is extremely light. Export movement has gone to smash as compared with recent high figures, and prospects for the near future are poor.

Charters to Rotterdam are being quoted at $5, the lowest since before the war, and the c.i.f. price in France is reported as low as $12, or about what was paid by many French purchasers not so long since in America, f.o.b. mines. The European situation is being blamed by some shippers here on propoganda of some of the English banks to the effect that French and other buyers should be cautious because of the decline in exchange rate of the American dollar. Coal men here say that English "smalls" is bringing 70 shillings at Cardiff and European buyers will shortly awaken to the fact that they can purchase again on this side to advantage.

Few charters are being announced and the Curtis Bay piers of the B. & O. have reduced working forces to one-third of recent shifts. For the first ten days of December less than 70,000 tons were loaded here on export cargo account, whereas the month of October had a total of 499,442 tons.

Prices on both export and domestic coals are the lowest in months. Of gas coals the best ¾-in. is offering freely at $5 f.o.b. mines, net ton, Pool 34 at $3.50, and Pool 33 at $4. Best steam coals, such as Pool 9, are offering at $5; Pool 10, $4.50 and Pool 11, $4@$4.25. There is hardly any call for Pool 18, which can be had around $3.50.

**Anthracite**—Local receipts continue fair, and the last threat of famine has been wiped out. Mild weather held down consumption all through November, and during that time some 60,000 tons were received. If this rate is continued there should be no real trouble, although the dealers will be kept busy most of the winter making belated deliveries.

The thing that worries the trade just now is the price condition and the fact that a big jump has been made in rental basis of yards, trestles, etc., leased by them from the railroads. Rentals have been jumped at the yards here, in some cases more than 100 per cent, it is stated. This makes the margin of profit so low that the trade is looking forward to another retail price increase unless there is a cut in wholesale costs.

## BUFFALO

*Tendency of Bituminous Prices Is Still Downward—Consumers Getting Enough from Contracts—Deliveries Are Prompt —Anthracite Stress Is Over.*

**Bituminous** — The tendency of all prices, except possibly on the scarcer gas and smithing varieties, is still downward. Some days ago jobbers agreed that they were no longer able to get $5, mine price, for steam coal. Most of them object to any quotation, saying that the prices are too unsteady. Still the variation is and has been small from day to day, but without a shadow of recovery. Jobbers are already predicting a price as low as $3.50. And why not? A great part of the bituminous coal that has gone into consumption since last April has been on annual contracts ranging $3.25@$4.75 and operators seem to believe that they are now getting the best of the bargain, after sitting by and seeing others make most of the money in the business.

Quotations are: $4.25@$4.75 for Pittsburgh and No. 8 lump, $4 for mine run and slack, including Allegheny Valley; $6@$6.50 for Youghiogheny gas, smokeless and smithing, to which add $2.36 for Allegheny Valley and $2.51 for all other to cover freight.

**Anthracite**—Retailers now have coal for all comers, though not in much quantity. The weather is colder, but not severe, the Lake season is closing and all this means that the sortage is practically over. As to districts North and West that are covered from here it will be practically impossible to say for awhile, as consumers are still buying all the anthracite they can get.

Independent anthracite premiums are dropping. There are quotations at $13 at the mines, which is about $4.50 over the standard prices. Demand is light, which shows increasing confidence in the standard mines being able to meet the needs of consumers.

**Lake**—The last cargo has not been shipped yet, but only one shipper is in the market for tonnage. The showing is fair, shipments to December being 3,507,389 net tons, to 4,076,118 tons to the same date last season. With a winter of ordinary severity the supply ought to be sufficient.

December shipments have been good, being for the week 77,000 tons of which 28,500 tons cleared for Milwaukee, 24,300 for Chicago, 17,000 for Duluth and Superior, 4,200 for Port Arthur and 3,000 for Fort William.

**Coke**—Prices have been going down pretty fast. Jobbers differ as to quotations from the ovens, but a good average would be $7.50 for 72-hour Connellsville foundry, $7 for furnace and $6 for off-grades and stock. The market for domestic coke has weakened still more, on account of the expectation of a better supply of anthracite. Furnace sizes sell at $6.50 and small sizes $10.50.

# Northwest

## MINNEAPOLIS

*Mild Weather Causes Buying Slump—Trade Awaits Lower Prices—Increasing Competition of All-Rail Coal—No Fears of Severe Shortage.*

The excitement has well died out of the coal situation for the Northwest,

and has been replaced by an ambition on the part of buyers to break the market. Some of the ones who but a short time ago were frantic to get coal at any price, are now figuring carefully to get prices down considerably. The transition from the attitude of importunacy to disdain has been almost lightning-like in its speed.

With December well started, there has been only a little freezing weather resulting in a sharp decrease in consumption. If there is the slightest touch of severe weather, it will find many dealers short of coal and ready to pay the market price. Many shippers have not attempted to find a market for the dock stocks, confident that the market would have to find them the minute cold weather prevailed. Yet a continuation of mild weather will doubtless mean carrying over some high-priced coal on the docks. Already the all-rail market is fairly demoralized. Lower grades have been cut $3 and more in an effort to hold business, which began slipping to the better grades the minute there was an opportunity to select.

The shortage of hard coal has been completely wiped out. Dock receipts are about equal to those of 1919,—showing only a difference of 63,000 tons, and reduced consumption already has more than saved that amount. Receipts of soft coal on the docks to Dec. 1 are 100,000 tons over 1919, with a total of 6,955,000 tons. However there is a difference in the carry-over from the preceding season which gives around 2,000,000 tons in favor of 1919. But this has been about offset by reduced consumption plus the diversion of buying to other fields.

Navigation may continue for some time into the month, and quite a little additional tonnage be forwarded, the weather permitting. So the comparison with a year ago will become more and more in favor of the present season. Already the fears of a severe shortage are pretty well past. A severe winter, however, would cause a shortage of soft coal toward spring, while a continuation of mild weather may force a reduction in dock prices.

Movement of coal from the docks shows a decrease of around 15 per cent. This might be accounted for on the theory of the mild fall. But that would not take into consideration that there is usually, in the fall, advance preparation and stocking of all the coal that bins will hold. While dealers' bins are probably far from empty, yet the rush that follows severe weather will speedily run them down. The hope of lower prices has held back orders.

Stocks on the docks are not excessive. Anywhere near an average buying would clean them up. Yet if the trade continues to hold back there may even be a surplus at the end of the season. And if the mild weather continues, competition from cheaper all-rail sources will be increasingly strong. For this production has been on a cold-weather basis, and consumption has been far from it.

### MILWAUKEE

*Rail Receipts Are Satisfactory—Mild Weather Eases the Situation—Prices Continue Unchanged—Coal Investigation Report Not Made Public.*

Mild weather has curtailed the demand for domestic and the slowing up of industries has checked the drain on steam stocks. Coal of all kinds is easily obtained; in fact, coal men are soliciting business. It is estimated that city consumers are 100 per cent supplied but that the country is still 40 per cent short of normal. However, the latter needs are now being made up rapidly.

Milwaukee's winter supply will be ample provided rail conditions permit a fair inflow. Coal is still coming by Lake but the end is near, and another week will probably see the last cargo docked. The expected closing rush did not materialize. December receipts thus far aggregate 44,417 tons of anthracite and 110,806 tons of soft coal. The season's receipts by Lake will be about a million tons short of last year.

Coal is coming steadily by rail from Illinois but at the present time dealers are so well supplied that they are turning down offers of Western producers. The result of the coal investigation is being withheld by Attorney-General John J. Blaine, who says he is not entirely satisfied with the facts adduced at the several hearings and who intends to continue the inquiry.

## Inland West

### CLEVELAND

*Acute Car Shortage Disturbs Domestic Trade—Close of Navigation Fails To Bring Expected Relief — Bituminous Mine Prices Drop — Anthracite and Pocahontas Scarce.*

**Bituminous** — Improvement in the coal supply expected as a result of the closing of the Lakes has failed to develop, due to a greater scarcity of cars within the last week or ten days.

The Ohio coal situation, if it were not for present transportation difficulties, would now be easier than at any time within the last year. Continued mild weather has not only tended to facilitate deliveries, but has held back the flood of orders that otherwise would have been placed with dealers. Retailers are caught up with deliveries for the first time in many months, but are now getting barely enough coal to meet current demands.

One explanation of the growing car shortage is that many cars badly in need of repairs have finally been sent to the shops. This is believed to be particularly true of cars used in the Lake trade.

Prices at eastern Ohio mines dropped this week. Domestic is now selling $4.25@$4.50, and steam $3.75@$4. Both operators and wholesalers are inclined to regard these prices as rock bottom for some time to come as domestic demand is likely to become more pronounced during the next few months.

Severe cold weather and continued car shortage might cause a serious situation in this section. The miners, probably due to the nearness of the holiday season, are working as steadily as the car supply will permit.

Assigned-car supply in the No. 8 field is estimated at 65 per cent, for unassigned about 55 per cent. Railroads are coming into the market for Ohio coal and operators are attempting to meet some of these requirements in addition to supplying the domestic market. Operators recently have received inquiries for coal from points in Indiana and some sales have been made.

**Anthracite and Pocahontas**—Hard coal has advanced in the retail market from $15.10 to $15.30. The supply continues scarce, daily receipts for the past week being only 12 carloads. Dealers are taking orders for domestic sizes without promising delivery and at prices to be determined by the market. Shoveled Pocahontas lump has advanced from $11.75 to $12 at retail and is about as difficult to obtain as anthracite. All other retail prices are practically unchanged.

**Lake**—The coal rate to the head of Lake Superior was advanced Dec. 6 to $1.50 and two boats were loaded at this figure. Shipments for the season up to Dec. 6 were 22,366,876 tons compared with 21,713,341 tons for the same time last season, and 28,153,317 tons in 1918.

### DETROIT

*Demand Is Sluggish — Prices Slightly Reduced — Buying Confined to Current Needs Only — Anthracite Receipts Improve.*

**Bituminous**—Though coal is arriving in fair quantity, the amount is apparently not so great as to create any excess of supply or leave accumulations on tracks. Wholesalers and jobbers say free coal is not yet easily found.

Buying in the steam branch reflects the sluggish condition of business in general. Buyers usually are taking only about enough stock to satisfy current needs of their plants and appear unwilling to add much to reserves. There is a feeling that the business situation is such that it is desirable to maintain resources in as liquid a form as possible, while waiting for a clearer development of future prospects. The belief among some of the buyers that coal prices are likely to be lower also is an influence encouraging delay in purchasing stock.

Domestic consumption has been greatly reduced by mild weather. Retailers, with a shrinkage of business, hesitate about increasing yard stocks to any substantial extent until a more active distribution of present supplies is under way.

Hocking domestic lump is quoted at the mines at $7 while mine run is around $5 and slack $3.75@$4. For West Virginia lump $8 is asked, with

mine run $5.25@$5.50 and slack $4.75@$5. Smokeless coal is still scarce although larger shipments are expected.

**Anthracite**—With Lake shipments terminated receipts are reported showing gradual improvement, though the supply is still far below normal.

## CINCINNATI

*Rail Receipts Still Lag—River Coal Aids—No shortage for Cincinnati District—Strong Call for Domestic.*

Very little change in the condition of the coal market in Cincinnati was reported during the past week. Although the movement into the local market still lags to a certain degree enough is being received by consumers to keep operations somewhat near normal.

Shipments from West Virginia fields by way of the Ohio River continue to be a big factor in the supply. Dealers state the coal shortage, which is being felt to a great extent in other sections of the country, is not noticeable here.

Rail shipments continue very light, due to the shortage of cars at mines, although enough contract coal for steam consumers is being received. Dealers express the hope and belief that the car shortage will soon be relieved, which will bring the supply near normal.

Real winter weather is bringing all grades of coal in strong demand. Dealers say that the majority of the domestic demands have been supplied and that there will be no acute shortage, at least in the Cincinnati district.

Prices quoted by dealers for coal and coke, delivered to the home, remain unchanged.

## COLUMBUS

*Sharp Decline in All Grades — Consumption Is Still Decreasing—Production Is Good.*

Several factors are uniting to produce weakness in all grades of coal in Ohio territory. One of the most potent is the continued warm weather which tends to ease the call for domestic grades. Weakness in mine run and screenings is due largely to the industrial let-up. Car supply in all fields is quite good and this still further tends to depress prices. Producers believe that prices will range throughout the winter at about the present levels with possibly still further declines in domestic.

Domestic trade is still active but the edge is off the market. Dealers are now cancelling orders and this has a depressing effect. Buying on the part of the public is not as active as formerly because they are waiting for lower prices and are buying only for present requirements. Retail prices do not yet reflect declines at the mines, although lower levels prevail. Hocking lump sells $8.50@$8.90, mine run is $8.25@$8.50. Pomeroy grades are selling at about the same prices. West Virginia splints retail $10.35 for lump and $9.75 for mine run, while Pocahontas lump is $11.50 and mine run $10.50.

Steam demand has fallen off to a large extent and screenings are becoming a drug on the market. Prices were generally lowered throughout the week. Railroads are taking some tonnage and a disposition to stock up for the future is noted among trunk lines. Public utilities are well supplied and reserve stocks are being built up.

Production is holding up fairly well in all fields. Toward the latter part of the week some shortage of cars appeared in the Hocking Valley although this was not serious. The principal cause of reduction from capacity figures is labor shortage, which means a disposition on the part of miners to take frequent holidays. The output of the Hocking Valley has been about 75 per cent and the same figures are reported from Cambridge, Jackson, Crooksville and Pomeroy.

Prices at the mines of the principal coals used in central Ohio are:

| | |
|---|---|
| Hocking lump | $4.00@$5.00 |
| Hocking mine run | 3.25@ 3.75 |
| Hocking screenings | 2.75@ 3.25 |
| Pomeroy lump | 5.00@ 5.25 |
| Pomeroy mine run | 3.50@ 4.00 |
| Pomeroy screenings | 2.75@ 3.25 |
| West Virginia splints, lump | 5.00@ 6.00 |
| West Virginia mine run | 3.75@ 4.25 |
| West Virginia screenings | 3.25@ 4.00 |
| Kentucky lump | 4.75@ 5.75 |
| Pocahontas lump | 5.75@ 6.50 |

## ST. LOUIS

*Market Decline Continues — All Demands Soften — "No Market" Losses Appear—Prices Tumble.*

Continued mild weather has almost shut off the local domestic demand. A continued depression in industrial circles has reduced the price of steam very near to production cost in the Standard field. Retail prices are firm: Carterville, $9.50; Mt. Olive, $8; Standard, $7.50; Anthracite $17.25@$18; Smokeless $16.50.

Locally, a little hard coal is moving in but there is no call for domestic. Alabama coke is moving through to points Northwest to replace the shortage of anthracite.

Standard mines are experiencing "no market" conditions. Screenings are down to $2, mine run to $2.15 and lump ranges $3.25@$3.75. Mt. Olive conditions are somewhat better as the market is holding firm, lump coal at $4@$4.50 and steam largely absorbed on contract. Mines in both fields who are working on railroad coal are generally running five days a week.

For the first time in months Carterville coal is being freely offered on the open market. Independent quotations have come down to circular prices.

Water shortage continues to hamper some southern Illinois operations and water is being hauled in by the railroads.

## MID WEST REVIEW

*Steam Coals Slump — Large Buyers Cancel Contracts — Operating Conditions Excellent — Domestic Sizes Are Firm.*

The weather man certainly has it in for the coal industry, as another week has passed and we are being treated to a temperature just about what it should be during the Indian Summer.

In the country, domestic coals are holding up very well indeed, but all through the territory steam is slumping. Mine run and screenings are especially weak although 1¼-in. lump and egg are by no means strong.

There has been an epidemic on the part of the coal-buying public to cancel contracts and current orders. Apparently a contract means just as little to the public now as it did to a great many coal men during times when coal was abnormally high. The trouble is, however, that a great many perfectly responsible coal companies are now being called upon to suffer for the transgressions of their less reliable associates.

We understand that an attempt has been made on the part of some railroads to cancel their coal contracts outright. The reason given is that they are not handling anywhere near the freight that they expected to and consequently can not use the contracted amounts.

Various manufacturers in the Middle West are not very optimistic and additional plants are shutting down almost daily. No strengthening of the coal market can be looked for until American industries get in better shape.

At the mines cars are now plentiful. Some of the roads that are not as well equipped as others have been able to furnish their mines with so many cars that tipples and switches have been blocked with loads. Labor is most certainly on the job.

Current mine prices quoted on the open market are as follows:

| | |
|---|---|
| Southern Illinois (Franklin, Saline and Williamson Counties): | |
| Prepared sizes | $4.25@$6.00 |
| Mine run | 3.50@ 4.25 |
| Screenings | 2.50@ 3.25 |
| Central Illinois (Springfield District): | |
| Prepared sizes | $4.00@$5.25 |
| Mine run | 2.25@ 3.00 |
| Screenings | 1.75@ 2.25 |
| Northern Illinois: | |
| Prepared sizes | $5.00@$6.00 |
| Mine run | 3.75@ 4.50 |
| Screenings (washed) | 4.00@ 4.50 |

| Indiana (Clinton and Linton, Fourth Vein) | State | Outside State |
|---|---|---|
| Prepared sizes | $3.45 | $4.25@$5.25 |
| Mine run | 3.20 | 3.00@ 3.50 |
| Screenings | 3.00 | 2.25@ 2.75 |

| Indiana (Knox County, Fifth Vein): | State | Outside State |
|---|---|---|
| Prepared sizes | $3.25 | $3.50@$5.00 |
| Mine run | 3.00 | 2.25@ 3.00 |
| Screenings | 2.80 | 1.75@ 2.25 |

## CHICAGO

*Trade Is Stagnant — Heavy Domestic Shipments Being Received — Some Cut in Anthracite Prices — Shortage Is Ended.*

Chicago coal trade is not only dull but stagnant. Manufacturers have more coal than they want on hand and the average retail dealer has his bins full. Substantial price reductions must be made to move any product.

During the past week a very substantial tonnage of Pocahontas and New River mine run has arrived. Early in the spring those dealers who were fortunate, as it seemed to them then, placed contracts for smokeless at $4.25

@$4.90. Until lately they received no coal on contract but now that the export business has stopped for the time being, local dealers are getting more Pocahontas than they can comfortably handle.

There has been a very little weakening on anthracite. Some of the "Independents" have been offering small price concessions. They have been so small that they have had but little effect on the market. Hard coal, however, is becoming plentiful and it is only a question of time before the agencies will not only reduce their prices but be in want of orders.

## Southwestern

### KANSAS CITY

*Steam Sizes Weaken — Car Supply Is Ample—"No Market" Losses Cut Production—Labor Is Adequate.*

During the past week there has been a further leveling of prices, but Arkansas coal is being held firm at last quotations.

Kansas domestic grades are steady at $6; steam grades are quoted $4@$4.75. Missouri domestic is $6, steam $3@$5.50, depending on quality.

Some mines have had idle time during the past week on account of lack of demand. Car supply has been ample and transportation exceptionally good for this season of the year.

The weather continues warm. This has resulted in a great many cancellations on all grades of coal. Labor at the mines is ample and the disposition of the men is to stick closer to jobs than they have for several years.

Broken running time is to be expected during the holidays and probably not more than 50 per cent of the usual tonnage will be produced, and with seasonable weather we will again have a cry of coal shortage. So far as the Southwest is concerned, there never has been a coal shortage, but we have had a coal buyers' panic.

## South

### LOUISVILLE

*Production Increasing with Demand Decreasing—Steam Prices Show Steady but Slow Decline — Gas and Byproduct Grades in Better Demand.*

Production is rapidly increasing as a result of good weather, fair labor conditions, and much better car supply. Some sections of eastern Kentucky are now operating 80 per cent of capacity, the best record of the year. Some districts of that section are not getting as good a supply due to poor railroad facilities for handling cars in and out.

A good deal of coal is now being screened, but the demand for lump is slumping fast as retailers are finding a poor demand in view of mild weather and a feeling among consumers that prices will be lower.

Steam coal is being disposed of, but it is a matter of selling organizations today, and the concern without these facilities is having some trouble in marketing fuel. Orders for steam are expected to continue only fair until after Jan. 1, which is Federal inventory time for tax returns with the bulk of consumers. After that time buying should be more freely done, as supplies will not have to be shown on invoice basis as stock on hand.

The first shipment of river coal of any size in weeks arrived, Dec. 4, when the "J. T. Hatfield," of the Reliance Coal & Coke Co., brought one barge of West Virginia coal to Louisville, and seven to New Albany, Ind.

Eastern Kentucky mine prices are; prepared sizes, $6@$7, mine run, $4@$5, screenings, $3.25@$3.50. Western Kentucky lump is $5@$6, mine run, $3.50@$4.50, screenings, $2.75@$4.

Retailers are cutting prices on western Kentucky coals by $1.70 a ton, due to drop in the market there. Retail prices show lump coal delivered, $11.50 for eastern Kentucky; $8.80 for western Kentucky. Western Kentucky mine run is quoted $7.50, slack, $6.50.

### BIRMINGHAM

*Steam Demand Is Very Light—Domestic Market Easier—Car Supply Somewhat Short—Labor Forces Practically Normal.*

Demand for steam from industrial sources continues light, but all high-grade fuel is disposed of without much difficulty. Larger producers are still behind on contract obligations and are producing little coal for the spot trade. Producers of low and medium grades are having to cast about considerably to provide disposition for their output.

Quotations have changed little and apparently are about to stabilize around $4@$4.25 for Big Seam mine run; $4.50@$4.75 for Corona; $4.25@$4.50 for Carbon Hill and $5@$6 for Cahaba and Black Creek.

Continued mild weather has eased the demand for domestic, though there is business in hand and offered far in excess of the production. There is no acute shortage for present needs at any point.

Production has assumed normal proportions, figures compiled by the Alabama Coal Operators Association for the week ending Dec. 4 showing 297,321 tons output for that period, with a shortage of 411 cars reported.

Labor is no longer any hindrance to production needed in this trade territory and a much larger tonnage could be taken out if required. Operations have been cut in some instances to five days per week. The strike has spent its full force and the open shop remains the fixed policy of mine owners in Alabama. Car supply is short on the L. & N. and somewhat less than requirements on the Southern. Other lines have furnished fair service.

## Western

### DENVER

*Prices Are Weaker — Labor Situation Is Quiet — Production Is Cut by "No Market" Losses.*

The market is soft, bituminous having joined with lignite in an uncertain demand. Thus far bituminous prices have been maintained, but lignite of second grade has dropped 25c. at the mines, which is reflected in retail prices.

Recent developments indicate that prices will go no higher. Operators are taking the stand that there has been no reduction, reconciling the 25c. lignite cut by claiming uniformity in mine price. The Rocky Mountain Fuel and the Colorado Fuel and Iron companies were among those that cut the retail price to $8.90.

Best lignite is $10.15 retail and $6 at the mine. Lignite steam remains at $5.30 retail, while Routt bituminous steam is $6.75 in Denver markets. Bituminous coking slack, mixed, is $8.05, and Walsenburg steam is $7.50. Domestic from Routt fields is $12.50, while southern Colorado grades are $11.50@$12. Furnace size anthracite is $17.60.

Production for the week ended Nov. 27 was 210,744 tons, representing 80 per cent of full time. Traffic problems are assigned to a lost output equal to 10 per cent.

The labor situation has quieted down, following the disturbance in lignite fields. Many of the mines are now running on half-time basis, due to unseasonable weather and hesitancy on the part of the public to buy.

## Canada

### TORONTO

*Continued Shortage of Anthracite—Famine Only Averted by Mild Weather —Soft Coal Plentiful, Demand Light and Prices Lower.*

Owing to the diversion of anthracite coal to New England and Western points the supplies coming to Toronto have lately been very limited. A coal famine has only been averted by the continuance of unusually mild weather. Dealers have none in the yards and are much behind with deliveries.

Fuel Controller H. A. Harrington states the Province is 235,000 tons short of its normal supply of anthracite and urges strict conservation and the use of substitutes wherever possible. Bituminous is plentiful and the demand light, with a general downward tendency in price.

Quotations per short ton are as follows:

| | |
|---|---|
| Retail: | |
| Anthracite egg, stove, nut and grate | $16.90 |
| Pea | 15.40 |
| Bituminous steam | 14.50 |
| Domestic lump | 15.00 |
| Cannel | 20.00 |
| Wholesale f.o.b. cars at destination: | |
| Three-quarter lump | 10.25 |
| Slack | 9.90 |

# News From the Coal Fields

## Northern Appalachian

### PITTSBURGH

*Car Supplies Ample — Spot Prices Irregular—Reduced Consumption Is Making Coal Hard To Move—Bonus Cuts Causing Dissatisfaction.*

Car supplies have been adequate in the past week. Occasional shortages have been of no importance and at not a few mines there have been more cars than operators could use, on account of the state of order books.

The leading interest, the Pittsburgh Coal Co., has ample orders for the amount of coal it can mine and is not seeking new business, although it is acting favorably upon some requests of regular customers to increase their allotments. Many of the independents, if not the great majority, are actively seeking orders, particularly for spot and prompt shipment, and naming such prices as they think will secure business. The difference in position is due, of course, to the difference in price policy this year, the Pittsburgh Coal Co. having rigidly adhered to its regular prices while in the open market some very fancy figures were obtained by many of the other shippers.

There are conflicting reports as to spot prices named, indicating that buyers and sellers are more or less at sea, but a steadier market is expected to be developed shortly.

Consumption has been falling off rapidly in the steel and other industries just at the time when Lake shipments ceased, this readily explaining the large increase in offerings.

The spot market is quotable about $3.50@$3.75 for steam mine run and $4@$4.50 for ¾-in. gas. The Pittsburgh Coal Co.'s prices are maintained, as formerly, at $3.75 for slack and mine run and $4 for screened.

During the period of scarcity many operators in the district paid bonuses or extras of various sorts to labor, and these extra payments are now being cut off, creating a little dissatisfaction and causing some men to shift their employment.

### CONNELLSVILLE

*Spot Market Turns Stagnant — Prices Are Easier—No Interest in Contracts.*

The coke market has turned absolutely stagnant, and precise prices are difficult to quote on account of the absence of transactions. Some operators have been soliciting bids for spot coke rather than quoting prices. Shipments against contracts are ample so that furnaces having agreements do not need to buy spot coke, and there are few furnaces in blast that are not supplied with contracts. Many have gone out and others are preparing to go out. Off-quality coke is offered at particularly low prices, though such coke commanded the full market price during the period of scarcity.

Coke producers who purchase electric power for their operations and who contemplate closing down with the low market are finding that a flat rate in many cases as high as $50 per day charged by power plants is a factor of overhead which may necessitate continuing their operations.

Producers find it impossible to interest furnacemen in contracts for the first half of the new year, and discussion as to what would be a fair price is dying out. Furnace men are disposed to await evidence that they will have occasion to operate before they think seriously about coke. In the case of foundry coke likewise there is an indisposition to contract. A large operator who some time ago made a number of contracts at $15 has revised them to $10, but other consumers are unwilling to take hold at this price. It is understood some operators have quoted $9 or less on contract without booking business.

The spot market is quotable at $7@$7.25 for furnace and at $8@$8.50 for foundry, per net ton at ovens. The *Courier* reports production in the week ended Dec. 4 at 217,900 tons, an increase of 5,480 tons, this being entirely on the part of furnace ovens, as the merchant output decreased slightly.

### UNIONTOWN

*Many Coke Plants Close—Coal and Coke Prices Seek Lower Levels—Operators Refusing to Make Further Price Concessions.*

Softening of the spot coke market because of failing demand has had the natural result in the Connellsville coke region, that of restricting output. Several hundred ovens at various merchant operations have been put out within the past week and indications are that the number will be substantially increased throughout the month.

Plants of furnace interests as yet have not commenced curtailing output and it may be assumed that the steel interests are taking this opportunity to stock some coke at point of consumption. This may be done very readily now when transportation conditions are good.

While both the coal and coke markets evidence a very delicate tone there is no alarm felt here over the situation. There is a conviction among operators that the period of readjustment is now in full swing and once inflated prices have found a normal level business will develop easily and steadily. The transition, however, cannot be accomplished in a short time and few operators expect a change until early in the year.

Coal is to be had in most any quantity at prices ranging $3.50@$3.75 and the furnace coke market is quotable $7 @$7.50. The status of the demand is such that a market level is almost impossible of determination. It may be said, however, that if sales not conforming to these quotations were made they were probably at lower figures.

## Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

### BITUMINOUS COAL

| | 1920 Week | 1920 Calendar Year to Date | 1919 *a* Week | 1919 *a* Calendar Year to Date |
|---|---|---|---|---|
| Nov. 20*b* | 11,693,000 | 488,218,000 | 5,344,000 | 414,712,000 |
| Daily average | 1,949,000 | 1,775,000 | 891,000 | 1,503,000 |
| Nov. 27*b* | 11,456,000 | 499,674,000 | 5,334,000 | 420,046,000 |
| Daily average *c* | 2,182,000 | 1,782,000 | 956,000 | 1,492,000 |
| Dec. 4*d* | 12,757,000 | 512,431,000 | 5,245,000 | 425,291,000 |
| Daily average | 2,126,000 | 1,790,000 | 874,000 | 1,480,000 |

(*a*) Less one day's production during New Year's week to equalize number of days covered for the two years. (*b*) Revised from last report. (*c*) Counting Thanksgiving Day as 0.25 of a working day. (*d*) Subject to revision. **All figures in net tons.**

### ANTHRACITE

| Week Ended | 1920 | 1919 |
|---|---|---|
| November 20 | 1,975,000 | 2,055,000 |
| November 27 | 1,692,000 | 1,759,000 |
| December 4 | 2,051,000 | 2,014,000 |

### BEEHIVE COKE

United States Total

| Week Ended Dec. 4*c* 1920 | Week Ended Nov. 27*b* 1920 | Week Ended Dec. 6 1919 | 1920 to Date | 1919 *a* to Date |
|---|---|---|---|---|
| 376,000 | 367,000 | 458,000 | 19,569,000 | 18,279,000 |

(*a*) Less one day's production during New Year's week to equalize number of days covered for the two years. (*b*) Revised from last report. (*c*) Subject to revision.

While both the coal and coke markets are undoubtedly in favor of the consumer there is no disposition on the part of producers to sacrifice tonnage for price. Several interests seeking to buy standard fuel at off-prices have found that operators are perfectly willing to allow tonnage to remain unconsigned rather than dispose of it at what they consider bargain prices.

This rather independent attitude is explainable by the fact that most operators are sufficiently reinforced financially to weather a pretty hard storm.

### CENTRAL PENNSYLVANIA

*Car Shortage Again Being Felt—Slight Recession in Prices—Demand Is Greatly Lowered — Wagon Mines Closing.*

Operators are again complaining of a shortage of cars. Throughout the fall there had been an ample supply in the eastern region of the district, including the Cresson and the Tyrone divisions but conditions were not so good in the central region which comprises the territory along the main line of the Pennsylvania in Cambria County and points west. Operators expected a better supply due to the industrial shut-down. The supply for the week over the entire field is placed at 50 per cent. Completed figures show a total of 89,375 cars loaded with coal during November. This will aggregate 5,000,000 tons.

Coal prices show but little change in the week. A further decline was noticeable in the vicinity of Johnstown. Pool 18 is quoted at $3.25. This is a low-grade coal but was selling at $12 a few weeks ago. Pool 9 is quoted $5 @$5.25, and Pool 10 $4@$4.25. It is predicted that the price will decline still further unless big buyers bid for supplies.

The majority of wagon mines throughout the central Pennsylvania field have been forced to suspend operations there being no demand for the fuel. Open weather is partly responsible for this condition, and dealers in the cities and towns can now depend on shipments by rail.

### FAIRMONT AND PANHANDLE

*Better Production Possible With Improved Car Supply—All Markets Quiet and Prices Are Lower.*

#### Fairmont

During the earlier part of the week ended Dec. 4 an excellent car supply was maintained, the supply dropping, however, to about 50 per cent the latter part of the week on all lines. The B. & O. shortage during the later period was due to another accumulation of loads. Tidewater movement decreased, Michigan and Ohio markets securing the bulk of the Western movement.

Prices reached a new low level, mine run being quoted $3.50@$3.75, lump ranging $4.25@$5 with a better call. There was but little activity in the spot market from any sources, and particularly in so far as foreign buying was concerned.

#### Northern Panhandle

In common with other districts in Northern West Virginia, this field was plentifully supplied with equipment, especially during the early part of the week. Transportation conditions on both the B. & O. and Pennsylvania were improved.

Buyers were still out of the market and spot prices declined further, mine run being $3.75, domestic $4@$4.25. Shipments were largely confined to contract obligations and there was no loss in production because of "no market."

### EASTERN OHIO

*Labor Working Better—Car Supply Is Still Unsatisfactory—Prices Recede Further—Market Weakens With Closing of Lakes.*

Production in the eastern Ohio No. 8 district for the week ended Dec. 4 was approximately 380,000 tons, as against a potential capacity production of 622,000 tons, based on total mine ratings.

Output was restricted in the main by the car supply, which averaged a little better than 65 per cent, with only 55 per cent supply for loading of commercial coal. Figures also indicate about 50 per cent of production is now going to railroads for fuel.

Inadequate car supply is attributed to closing of the Lake season when loading of coal to lower Lake ports was discontinued and cars were consigned to more distant destinations, thereby consuming greater time for their return empty.

Cargo coal on track at lower Lake ports amounted to 900 cars as of Monday, Dec. 6, which will be cleaned up this week, docks closing Thursday, Dec. 9. With final dumpings at Lorain, Toledo and Ashtabula during past few days total movement of Lake coal, cargo and fuel, for the 1920 season amounts to approximately 23,500,000 tons.

Prices have broken during the week, ranging $4.25@$4.50 per ton for lump coal and $3.75@$4 for mine run and slack, f.o.b. mines, apparently due to closing of navigation and limited demand of industries.

## Middle Western

### WESTERN KENTUCKY

*Prices Are Somewhat Weaker—Shortage of Cars Holding Production Back—Market Conditions Are Still Good.*

In view of short car supply operators are managing to maintain prices very nicely, and selling production without much trouble. Demand for steam continues fair, with block moving very well, the principal weakness being in screenings, for which demand generally is slumping in all fields.

Lump coal is being quoted $3.75@$7.75, the bulk of sales being $5@$6, with the field average at $5.80. Mine run is quoted $3@$6, bulk of sales being $3.50@$5, average, $4.30. Screenings sold as low as $2.15, and up to $6.50, the bulk being $2.75@$4, average, $3.20.

Car supply for the first week of December has been 58.8 per cent on the Illinois Central, and 38.8 per cent on the L. & N., this being below the average for November. However, better results are anticipated later in the month.

Movement South has been very fair, with some good demand for lump in several markets. Discriminatory freight rates have hurt movement into Indiana. Western shipments have also been good.

### DUQUOIN

*Excellent Car Placement Maintains Production—Steam Market Inactive—Unseasonable Weather Lowers Call for Domestic.*

With a good car supply during the first week in December, production ranged 80@90 per cent of capacity. The mild weather is a very important factor in the improved movement, as usually about this time only 60 per cent car supply is to be had.

Labor conditions reported during the week were very good and no time of any importance was lost by any of the operations in this district.

The steam market was very inactive and because of this most of the output was being screened to meet the domestic call. Shipments dragged throughout the week and even the domestic trade seemed unusually quiet for this time of the year. Mine run was dull and tonnage was moved with increasing difficulty. No mine run quotations are available; screenings sold off $2.75 @$3, while lump ranged $3.75@$4.25.

### INDIANA

*Heavy Output, Decreasing Demand and Mild Weather Depress Prices—Labor Is Working Smoothly.*

The past 60 days have been unsurpassed from a production point of view and the result is a vast output that is supplying the Indiana demand. There have been no marked declines in prices, but more free coal is finding its way to the markets and the calls are becoming fewer. Many industries have closed completely, cutting off the usual coal market there. Extremely moderate weather has also reduced consumption.

In spite of the fact that operators gained a considerable victory in the Federal court when two companies were granted a temporary injunction against the special coal and food commission to prevent its operation, producers are selling coal at the same prices as those set by the commission. Every indication points to a reduced price in case the declining demand continues.

November was marked by a lack of labor disputes, miners evidently desiring to get in all the work possible before Christmas. On Dec. 8 twenty-three mines were down because of car shortage, a larger number than usual, but most of the mines were small and the total loss was about 14,000 tons.

# Middle Appalachian

## HIGH-VOLATILE FIELDS

*C. & O. Congestion Lowers Car Supply —Eastern Embargo Removed, But Little Coal Available—All Demands Ease—Prices Reduced—"No Market" Losses Appearing.*

### KANAWHA

Car supply fluctuated during the week ended Dec. 4, but the trend was downward, averaging 75 per cent on Monday and only 35 per cent on Friday. While the long-standing Eastern embargo had been lifted the output was so curtailed that scarcely any headway was made in contract arrears. The dearth of cars was due to the fact that the C. & O. found it impossible to accept cars from connecting lines, owing to some congestion of loads. Mines on the K. & M. received a better supply which, however, dropped to about 50 per cent at the end of the week.

The free coal market was most apathetic, prices for steam ranging $4.50@$5; lump off at $5@$6. Resumption of Eastern buying was responsible for steam quotations remaining firm.

### NORTHEAST KENTUCKY

Production declined with a poorer car supply approximately 47 per cent of capacity being produced. The growing scarcity of cars common to all parts of the C. & O. system was brought about by serious congestion which made it impossible to accept empties for loading. On the L. & N. better service was maintained throughout the week.

There was a lack of demand from all sources and only in gas coal was there any activity. The steam market was quiet, owing to the general industrial situation. Prices ranged $3.50@$4 for steam mine run, lump, $8@$8.50. Screening ran strong, $3.50@$4.50.

### LOGAN AND THACKER

Conditions in the Logan field were discouraging. Poor car supply was the direct result of an accumulation of loads on the Guyan branch as well as elsewhere on the C. & O. Eastern territory has been opened after a long period of embargo. However, the car supply was so poor that but little tonnage was available for the East.

Spot demand was dragging on steam and byproduct coals, with a better call for domestic. Export buying was particularly sluggish. Mine run declined to about $3.50 a ton, while domestic ranged $6. Tidewater quotations slumped to $4.50.

Several companies whose mines have been shut down in the Williamson field because of the strike, resumed operations during the first week in December when it became evident that the military authorities had the situation well in hand. The November output is estimated at 135,000 tons. Transportation losses were light and the available tonnage was easily marketed. Prices ranged $3.50@$5 with a depression appearing toward the end of the week.

The fact that several operations did resume work was pointed out as demonstrating that despite low prices operations were not being interrupted so far by the falling market.

### VIRGINIA

Mines were greatly handicapped with a car shortage which enabled a run of only 60 per cent of capacity, a decline as compared with the preceding week. Some labor shortage was also noted. Despite the general dullness of the demand very few operations were closed because of "no market."

Domestic sizes led the demand. The steam trade was very inactive. Export coal sold off, $4.50@$5.50 while steam ranged $3.50@$4. Retrenchment and curtailment of industrial operations has cut steam buying to the limit.

## LOW-VOLATILE FIELDS

*Operating Conditions Improve Only in Tug River—Poor Car Supply Elsewhere—Export and Domestic Demands Are Light—Contract Obligations Take Majority of Output.*

### NEW RIVER AND THE GULF

Production was extremely light in the New River field during the week ended Dec. 4, a placement not exceeding 30 per cent greatly curtailing operations. While all demands were greatly decreased the output was so curtailed that the supply was not sufficient to meet such demands. Foreign buying was almost at a standstill and there was no activity in home markets. Prices were practically unchanged, $5 for steam, $6 for domestic and export up to $7.50. Owing to congestion on the C. & O. coal moved to its destination very slowly.

All car supplies declined in the Winding Gulf district. On the Virginia Ry. there was only a 50 per cent placement, while the C. & O. furnished a meager 25 per cent supply. The C. & O. had so many loads on hand and congestion was so serious that permission was asked of the Interstate Commerce Commission to discontinue delivery of empties for four days until the tangle could be straightened out.

Some contract negotiations were heard covering the entire year 1921 at prices offered by prospective buyers of $4.75@$5.50. Operators are so far behind on existing contracts that there is no spot coal available, and they are not actively negotiating on these contract offers. The foreign demand has slumped. The general price on whatever spot coal is available for home markets ranges about $5 a ton.

### POCAHONTAS AND TUG RIVER

Poor transportation facilities afforded by the N. & W. continued during the first week in December. While the demand was greatly lowered poor loading time offset any possibilities of production losses from "no market" sources in the Pocahontas region.

For such spot tonnage as was available a price was made around $5@$6. There was total absence of foreign demand although coal was being rapidly shipped to piers on old business. An influx of idle miners from other fields made for an adequate labor supply.

Tug River production increased approximately 20 per cent during the week with an excellent outlook for the second week of the month. Prices were still following the downward tendency of most other staple commodities. But little spot tonnage was available, contract shipments taking a large majority of the output.

Mine run ranged $5@$6, with prepared sizes slightly higher. Spot foreign orders were few nor was there any strength in the home market.

# Southern Appalachian

## SOUTHEASTERN KENTUCKY

*Car Supply Improves Materially—Poor Transportation Handicaps Production —Market Is Weak and Prices Decline.*

During the week ended Dec. 4 car supply on the L. & N. improved materially. Some sections are getting as high as 80 per cent supply, the best record of the year. With increased production poor handling facilities are slowing up mine operations somewhat. Labor conditions in general were satisfactory.

The spot market continued extremely sluggish, with a price range of $4@$4.50. Prepared sizes were in better demand at $6, and in some instances higher. Of the mine run available gas and byproduct coal was in better demand. Smaller producers with no contract provisions are practically out of the running as the present low price levels do not make for profitable operation.

# Western

## UTAH

*Better Car Supply Enables Producers to Fill Old Orders—Mild Weather Curtails Demand — Future Prices Are Uncertain.*

For the first time since March producers have caught up on orders, due to an improved car supply. Operations are being maintained 80 per cent of full time, instead of 50@75 per cent, as has been the case for some weeks.

Mild springlike weather is curtailing the domestic demand and at the same time aiding transportation conditions. It is now practically certain that there will be no increase in retailers' prices unless the Interstate Commerce Commission succeeds in its efforts to give the railroads higher freight rates.

# MINE And COMPANY NEWS

## ILLINOIS

**The Chicago & Alton R.R. handled** 157,575 tons of coal on its Springfield tracks or in its Springfield yards during the month of November. This tonnage was handled in 2,865 cars. Of this amount 222 cars or 110,000 tons were commercial coal and were shipped out of the district. The amount used by the Chicago & Alton constituted 665 cars or over 36,000 tons. Eighty-eight cars were delivered to public utilties or other large manufacturing concerns by the Chicago and Alton.

**The King Solomon Coal Mining Co.,** Springfield, of Indiana has filed papers of incorporation in the amount of $5,000 with the Illinois secretary of state, the company giving its principal Illinois office at Harrisburg. The officers named are W. H. Harrison, president and Arthur J. Franklin, secretary.

Two men were killed at **Slogo Mine, Marion, Illinois,** in an explosion caused by a windy shot. When the shot firers went down the shaft they found several props on fire and then found the bodies of the two men about 50 yards apart and about 500 feet from the scene of explosion which caused their death.

**The Fairbury Mine,** Fairbury, west of Duquoin on the Toledo, Peoria and Western Railroad, is delivering about $3,500 worth of coal monthly to the railroad company, all trains stopping there for fuel. Wagon trade is also served. About fifty men are employed.

**Madison County Mining Co.,** at Edwardsville, has resumed operations after being idle for over a week with labor trouble. The men employed at the plant recently went out on strike, claiming inadequate washing conditions in the wash house.

Coal is being hoisted daily from the new shaft of the **Jewel Coal & Mining Co.,** at Du Quoin. The new switch which the Illinois Central railroad has been working on for several weeks is almost complete. Up to the present time the coal which has been hoisted has been dumped on the ground, and as soon as the switch is completed it will immediately be loaded and shipped.

## INDIANA

**The Indian Creek Coal Co. of Indianapolis,** which owns and operates the **S. W. Little coal mine** at Littles, and the Blackburn mine, three miles north of Petersburg, started a large number of men and teams to work recently, grading a switch, two miles north of the city, where it will open the Blackburn No. 3 mine which is to be one of the largest coal mines in Pike county.

**The Indian Creek Coal Co.** during the last few months has leased hundreds of acres of coal land adjoining the property of the **Pike County Coal Co.,** and the new mine being put down by the Indian Creek Company is just one mile north of the Big Atlas mine, owned by the **Pike County Co.,** which is being equipped to handle more than 5,000 tons of coal daily.

**John T. Beasley,** member of a Terre Haute law firm and counsel for Terre Haute and New York capitalists, was in Princeton recently taking up leases on 1,100 acres of coal land near Somerville, eight miles southeast of Indianapolis, for which the syndicate paid $25 an acre. One thousand acres more will be taken up in a short time, Mr. Beasley said. The capitalists also are interested in the Evansville, Terre Haute & Indianapolis R.R., the old Evansville & Indianapolis line, and the development of the Somerville coal lands is a step toward enlarging the coal-carrying facilities of this road. Work on two shafts is to be started within thirty days.

Indications are that Gibson County will experience a boom in coal mining during the coming year. At Francisco, the **Ayrshire Coal Co.,** operating what was formerly known as the Royal shaft, is building a twenty-four room hotel a block and a half from the mine to house its unmarried employees. Some of the employees of this company live in Princeton and make the fourteen-mile round trip daily by truck.

**The Great Lakes Coal and Coke Corporation** of West Virginia, with a capitalization of $250,000, has been organized by Indiana and West Virginia capitalists and will have its general offices in Indianapolis. K. C. Adams, publisher of the *American Coal Miner,* of Indianapolis, is president of the corporation. The company has a lease on 1,292 acres of coal land in Boone County, W. Va., on Little Coal river. The acreage is known as the prize lease of West Virginia, owing to the unusual quality of the coal. The company will do an export business largely.

**The St. Mary's Coal Company,** Terre Haute, the holding company for the **Sanford Mining Co.,** has acquired 500 acres of additional coal land adjoining the 2,500 acres owned by the company a few miles west of Terre Haute. The price paid for the coal was $20,000.

## IOWA

A new coal mine near the station of Howell, north of Knoxville, on the Wabash railroad, has been opened by **Lloyd Greenland,** formerly of Knoxville. He has been engaged for the past month in sinking a shaft and has gone through a good vein of coal.

**The West Virginia Coal Co.,** Des Moines, which was awarded a contract to supply some of the city institutions with coal during the next year, has informed Supply Commissioner Thomas that they would not accept the contract and that the deposit of $500 which the company had made the city should be returned. The Board of Standardization, consisting of Comptroller Nolte, the Supply Commissioner and President Kinsey of the Board of Public Service held a meeting following the receipt of the notification and awarded the contract to other companies. The refusal of the West Virginia company to accept the city contract will cost the city of Des Moines approximately $10,000 because of the fact that the contract had to be awarded to the next highest bidder.

## KENTUCKY

**The Harlan Gas Coal Co.,** employing about 100 men, has a strike on its hands, which is reported to be resulting from refusal of the company to recognize the union Several other disagreements are reported in the district, with other strikes in prospect.

**The Canoe Creek Coal Co.,** operating inside the city of Henderson, has struck a five foot vein of coal at 194 feet, which is said to be one of the largest struck in western Kentucky. The company is composed of Morgan S. McCormick, Alexander Blair, Jr., and Edward P. Hart.

**The Possum Ridge Coal Co.** of Boonville, is putting in another switch to the Southern Ry., and a new tipple, spending $100,000 in improvements.

**The John Bull mines,** operated by the Cypress Creek Coal Co., have closed down for two weeks for repairs, putting 200 men out of work for that period. Other mines in the district are running almost full.

**The Consolidated Fuel Co.** of Pittsburgh, Pa., have contracted with the Roberts and Schaefer Co. of Chicago, for the installation of a Retarding Conveyor and Marcus Screen to be used in connection with their new tipple at Elsie Mine at Dalna, Ky.

**The Victoria Coal Co.,** owner of the Monarch Mine No. 11 and the Victoria Mine No. 9, both in Hopkins County, a few miles south of Evansville, Ind., disposed of its property to the Hart Coal Corporation, of Madisonville. The consideration was not made public, but it is said it will run into several hundred thousand dollars. Chicago capital is interested in the Hart Corporation, which also owns the Kingston Mine near White City.

The power house of the **Kentucky Cardinal Coal Co,** Harlan, recently burned, resulting in a loss of several thousand dollars. The fire was caused by a hot coal dropped by the fireman.

**The Devonian Coal Co.,** Allen, recently organized, is planning for the erection of a coal tipple at its properties.

**The Mossy Bottom Coal Co., Pikesville,** has filed notice of an increase in capital to $50,000.

The local properties of **The Elkhorn Co., Praise,** and the **Peerless Coal Co.** have been acquired by the Kanawha-Elkhorn Coal Co., with headquarters at Buffalo, N. Y. The new owner is planning for extensive development work, and proposes the installation of equipment for this purpose.

Representatives of the **Uniontown Mining Co., Uniontown,** visited Evansville recently to get labor. The mining company has started sinking a shaft near Uniontown. Joseph Steinmetz, in charge of the Federal employment office, sent ten men to work in the new mine and ten more will be sent the first of next week. About fifty men will be employed in the mine. More than 150 ft. of the 300-ft. shaft has been dug.

## MINNESOTA

**Twin Cities**—A report of the government engineers in charge of river improvements on the Mississippi between Minneapolis and St. Paul, points out that the use of the river for navigation of freight barges has not been developed. Minneapolis has shown little interest as no terminal facilities have been provided. Traffic men of Minneapolis, however, say that there is keen interest in the use of the river for freighting, but the terminals could not be provided sooner because of charter limitations. Steps have been taken to remedy this matter.

## MISSOURI

**The Karr Mining Co.,** Eugene, is planning for the development and operation of about 10 acres of coal property. Machinery will be installed for this purpose. J. W. Karr is president.

Options on 4,000 acres of rich coal lands have been taken and test holes have been drilled in preparation to the sinking of a large mine near Gillespie, Macoupin County, by the **West Virginia Coal Co.,** of St. Louis. The holes which were drilled in the neighborhood of where the two shafts are to be sunk, showed a nine-foot vein of coal with a solid rock top over it. The mine which is to be located about 2 miles north of Gillespie, will be served by the Illinois Traction System.

## NEW MEXICO

**The Cherokee and Pittsburgh Coal Co.'s** assessment for coal lands was cut from $105,069 to $52,960 by the tax commission as the result of the company's appeal, which alleged its assessment was far higher than that of other companies operating in Colfax County.

## NEW YORK

**The Mountain Coal Co.,** has been organized with $50,000 capital stock. It will take over the individual trade of **Thomas M. Byrne,** who is the principal stockholder in the company. Mr. Byrne was formerly Buffalo agent for Thorne, Neale & Co.

## NORTH DAKOTA

**The Beulah Coal Mining Co., of** Bismarck, has contracted with the Roberts & Schaefer Co. for changes in its tipple and hoisting equipment at the mine at Beulah.

## OHIO

**The Universal Fuel Co., of** Nelsonville, chartered recently with a capital of $100,000 has secured a lease on a tract of 300 acres near Murray City which will be developed at once. A switch and tipple will be constructed and it is hoped to be loading coal shortly after the first of the year. Organization of the company has been effected by the election of F. J. Riddle, president; C. S. Graham, secretary-treasurer and William Huddy, George Kelly of Pittsburgh and H. H. Orr of Columbus, directors.

**The Carrington Coal Co.,** incorporated several weeks ago with an authorized capital of $50,000, has taken over four mines in the vicinity of Shawnee. Two of the mines were owned by the Pine Hollow Coal Co., and the others by the Carrington Coal Co., a partnership. Charles McMillan of Shawnee is at the head of the company.

**The Neff Coal Co.** has been chartered with a capital of $50,000 to operate a mine in the eastern Ohio district. Incorporators are E. McFarland, C. Neff, H. A. Neff, A. T. Neff and H. B. Neff.

Papers have been filed increasing the authorized capital of the **Ohio & Kentucky Fuel Co.,** from $50,000 to $100,000.

The mine of the **Hisylvania Coal Co.,** of Glouster, which was flooded several months ago by water breaking through from another working, is being pumped out. At first a pump was installed to throw 6,500 gallons per minute and later a second pump was added. The level has been reduced by about 18 inches and it is believed the mine will be ready for operation about Feb. 1 Special pumps had to be secured as the water was heavily charged with sulphur and thus metal parts soon gave way.

Assistant U. S. Attorney William Ford has arranged to confer with District Attorney Clark at Cincinnati soon over the question of a **grand jury investigation in the southern Ohio field.** It is announced that a number of questions arising from the production and marketing of coal in that field will be presented to the U. S. Grand Jury in December. Special agents of the Department of Justice have made investigations in Ohio and the results will be placed before the grand jury. The next term of court convenes Dec. 7.

**The Philadelphia & Cleveland Coal Co.,** of Cleveland and Columbus, formally took over its storage plant near Groveport, Dec. 1. This plant, which is designed to store about $100,000 tons of coal, has been completed under adverse circumstances, one of which was a strike of electricians. The plant is near the Walnut Creek power plant of the Columbus Ry., Power & Light Co., and is especially designed to take care of the fuel requirements of that concern. Storing of coal at the plant will start at once. Overhead tracks, unloading machinery and other special equipment have been installed.

Three barges containing 1,500 tons of coal, which were part of a fleet of 125 barges, en route to Cincinnati from Point Pleasant, West Virginia, were sunk in the Ohio River at Dam 35, below New Richmond, while in tow of the towboat Katherine Davis. The barges sank when they struck a sand bar in the river, but officials of **Island Creek Coal Co.** at Cincinnati, consignees, expressed the belief that most of the coal would be salvaged. The coal fleet save for the three barges which were sunk arrived in Cincinnati bringing 75,000 tons of soft coal which dealers say is about a ten days' supply of fuel for Cincinnati consumers.

**A number of operating companies have been organized** in various parts of Ohio recently. Among the number are: The Cadiz-Fairmont Coal Co., Cadiz, capital, $100,000; incorporators, P. Johns, D. W. Salway, L. X. Salway, C. W. Pettey and M. Robinson. The Universal Fuel Co., Nelsonville, capital, $100,000; incorporators, D. N. Postlewaite, J. W. Bricker, R. C. Martin, R. Hade and F. Hauck. The Northwestern Coal Co., Columbus, capital, $50,000; incorporators, C. F. Hively, J. T. Ward, F. E. Callahan, C. R. Fishbaugh and E. M. Petty. The Marcoll Coal Co., Bridgeport, capital, $70,000; incorporators, T. C. Heinlein, D. H. James, J. A. Heinlein, J. E. Fox and F. T. Spriggs, The Cassel Coal Co., Cleveland, capital, $75,000; incorporators, A. F. Baier, D. O. Sawyer, P. G. Brooks, G. F. Frank and E. M. Lewis. The Comerstown Clay & Coal Co., New Comerstown, capital, $150,000; incorporators, J. Murray, H. D. Cusick, S. O. Hughes, W. A. McIntyre and B. F. Bell.

Work on the new mine being developed at Crooksville, near the Tropic mine, by the **New York Coal Co.** is being held up and will not be pushed until spring. A shaft is being sunk to tap a large acreage. It is planned to start work as soon as the weather will permit in the spring.

Papers have been filed reducing the authorized capital of the **Derby Coal & Coke Co.,** Columbus, from $100,000 to $25,000.

**James Williamson** of Columbus will soon open a new mine on the Chapman coal property, located near New Lexington.

## PENNSYLVANIA

**The Wilbur Coal Mining Co.,** Johnstown, has contracted with the Roberts & Schaefer Co., Chicago, for a Marcus Screen and Loading Equipment for their No. 6 Mine. Construction work is now progressing and the installation will be in operation within a short time.

**The Moshannon Coal Mining Co.** of Osceola Mills, Pa., has contracted with Roberts & Schaefer Co. of Chicago, for the installation of additional conveying equipment to be used in connection with their No. 11 Tipple.

Two thousand six hundred acres of coal lands in the Scotch Valley, near Hazleton, formerly owned by Charles McCaffrey, have been disposed of to an organization in New York. It is understood the new owners are planning for the development of the tract.

The fire on Nov. 15, at the mine of the **Uniontown-Connellsville Coal Co.,** Brownsville, caused a minimum loss of $1,000,000 and forced over 200 operatives out of work. The cause has not been determined.

**The Ridgeview Coal Co.,** Bolivar, will defer the erection of its proposed new housing development until early in the coming year. Plans have been completed for the erection of an initial unit of 15 two-story houses for miners' use. J. K. Johnston is in charge.

**The Federal Foundry Supply Co.,** North Charleroi, Pennsylvania, will build a new coal crusher in connection with its proposed local plant on property recently acquired at North Charleroi.

**The Philadelphia & Reading Rd. Co.,** Philadelphia, will build a new coal pocket at Tulip and Somerset Streets to cost about $12,000.

**The East Brady Coal Co.** is opening an additional mine on its property at the mouth of McGee hollow in Madison township, Clarion County, and building tipple and trackage to accommodate the output.

**The J. H. Hillman interests,** Pittsburgh, are increasing their coal holdings in Greene County. The interests have just acquired a tract of 288 acres just outside Waynesburg from the Ezra Sayers estate. The Hillmans bought approximately 1,000 acres in that section some six month ago.

**T. P. Burns** has started the installation of an extensive coal plant on Pergum Hill, near Nant-y-Glo, Cambria County, where he has located a rich seam. The mine is expected to be one of the biggest producers in the Nant-y-Glo field.

## TENNESSEE

Attorneys for the **Pleasant Valley Coal Co.** and the Guaranty Trust Company, requested the court to dismiss the appeal of Truman A. Ketchum from decision of the Circuit Court of Appeals, 8th circuit, wherein Ketchum lost his claim to title to 160 acres of coal land in Utah. The coal company contends the decision of the Court of Appeals is final and that the Supreme Court is without jurisdiction to review the case.

## VIRGINIA

**The Tomb Coal Co.,** organized with a capital of $25,000, has acquired 80 acres of coal property at Raven and arrangements are being made for its development with a daily capacity of about 70 tons. W. J. Tiller is construction engineer.

## WASHINGTON

A large force of men is now prospecting and opening veins on the 120 acres of coal land on the north fork of the Newaukum about 12 miles east of Chehalis which the **Balcuna Coal & Coke Co.** of Raymond has purchased through the **Big Four Land Co.** One vein is a 15-ft. vein which lies near the surface. There is said to be a large quantity of coal in this section of a subbituminous grade which the owners and promoters claim is the best of its kind discovered locally, and which can be mixed at a low expense.

In announcing the placing on the market of a semi-anthracite product, the **Carbonado Coal Sales Agency,** Seattle, declares that it has found that its mines are unique in the history of the country, as they comprise the only mining property in the United States which produces two distinct kinds of coal, bituminous and semi-anthracite.

Dr. Bailey Willis, Stanford University geologist, recently completed a survey of the Carbonado mines, and declared the quantity and quality of the deposits unusual.

## WEST VIRGINIA

**The Carter Coal Co. of** Coalwood will proceed at once at the Olga Mine with the installation of a 4-track steel tipple which will be complete with Marcus screens and shaker loading booms.

**The Buffalo-Eagle Colliery Co.** of Braeholm, Logan County, is building a power house of 40 x 120 ft. which it expects to have completed by February. The power house will be equipped with 2,500 kw. G. E. Turbo units, and 2,500 hp. battleship boilers of high efficiency.

**The Matta May Coal Co.,** Williamson, is planning for the rebuilding of its drumhouse, recently destroyed by fire, caused by an explosion.

**The Eagle Coal Co., Eagle,** is planning for the development and operation of property at Montgomery, recently acquired for a consideration of about $40,000.

**The Ralco Coal Co.,** Beckley, recently organized, is planning for the erection of a coal tipple at its local properties. The company has a tract of over eighty acres of land and plans for extensive operations. M. B. Hoffman is president and general manager.

**The Climax Coal & Lumber Co.,** Buckhannon, is planning for the installation of machinery for the development and operation of its local coal properties. The equipment will include a number of mining cars.

**Windsor Coal Co.,** Beach Bottom, has arranged for the immediate erection of a two-story machine shop, 52 x 142 ft., to cost about $50,000.

**The Carbon Fuel Co., Carbon,** is planning for the rebuilding of its head-house, recently destroyed by fire with loss estimated at about $75,000, including equipment.

**The Porters Block Coal Co.,** Porters Creek, recently organized with a capital of $50,000, is planning for the erection of a new tipple at its properties in this district. A number of mechanical buildings will also be erected, including pump house, fan room, and general machinery department. The company has a tract of about 600 acres of land, and will develop an initial monthly output of about 100 tons. At a later date, this capacity will be doubled. Headquarters have been established at Huntington, W. Va.; David Metheny is president, and W. W. Smith, secretary.

**The Main Island Creek Coal Co.,** Omar, which owns over 30,000 acres of coal land in the famous Logan Field of West Virginia has just completed twenty new houses for its miners at Stirrat.

Memos Kester, one of the Greek miners of the Company, earned over $308.00 in two weeks time a short while ago, loading coal in Mine No. 4.

## ALBERTA

It is estimated by the Government mines branch that **Alberta's coal production** for 1920 will be 30 per cent in excess of last year's. A total output of over 6,500,000 tons is expected, as compared with 5,000,000 tons in 1910

## NOVIA SCOTIA

The output of the mines of the Dominion Coal Co. for the month of October amounted to 272,283 tons as against 263,809 tons for the month of September, and 279,964 tons for the month of October, 1919.

## Association Activities

### Harlan Coal Operators' Association

Through discussion of the car shortage, steps to better existing conditions in the Harlan field and the election of officers for the coming year were the events of a meeting of the association, held in November.

Officers elected were: president R. C. Tway, president of the R. C. Tway Coal Co.; vice president, B. W. Whitfield, head of the Whitfield interests, and secretary, E. R. Clayton. The board of directors named during the meeting is composed of R. W. Creech, S. V. Preston, W. A. Ellison, E. Guthrie, P. E. Bennett, G. H. Marting and J. C. Stras.

## Traffic News

**The appeal of the Republic Iron & Steel Co.** from the decision of the Alabama Supreme Court to the U. S. Supreme Court of the former's decree validating the iron ore and coal tonnage tax has been withdrawn. The Republic company made a test case of the legislative act of 1919 imposing this tax on iron ore and coal mined in the State, and the Alabama Supreme Court sustained the lower court, holding that the tax was in the nature of a privilege or franchise levy and therefore did not constitute double taxation as set out by the plaintiff. It was stated at the time this tax was incorporated in the general revenue law that it was a measure for temporary relief for the State treasury, and its collection will probably be discontinued with the passing of conditions which caused its enactment.

The I. C. C. has denied, effective March 1 next, **the application of the Illinois Central and Yazoo & Mississippi Valley R.R.** for authority to continue rates on bituminous coal, bituminous coal briquettes and anthracite coal from and to points in Alabama, Arkansas, Illinois, Indiana and other contiguous States, without observing the long and short haul provision, on the ground that sufficient justification was not shown.

**C. F. Giles, of the L. & N. R.R.** at Louisville, has announced that orders for 2,000 steel gondolas have been placed on deliveries will start Jan. 1, at the rate of 50 cars a day. The total cost will be over $5,000,000.

**The Illinois Central RR.** has announced that it received 1,000 new cars prior to Nov. 1, and that 1,150 are undr construction.

**L. & N. R.R. Development**—In order to facilitate coal shipments from the rapidly developing Harlan County field, the Louisville & Nashville will make $2,000,000 improvements at Baxter, in the southern section of Harlan County. This will consist of a roundhouse, a coaling bin and thirty-five or forty miles of additional side tracks. It is expected that this work will be launched soon after the first of the year.

Alleging that orders of the special coal and food commissioner of Indiana for the delivery of coal by the **J. K. Dering Co.** to dealers in certain Indiana cities constituted an interference with the company's business, the company has filed suit in Circuit Court of Vigo County, Indiana, asking that the commissioner's order be declared void and set aside. The Dering company is an Illinois company, but it owns two mines in Indiana, the complaint sets out. The company says it had contracts with dealers and utilities inside and outside the state for the purchase of the coal produced at these two mines up until March 31, 1921, and these contracts called for all the coal it would be possible to produce in the two mines in that period. The company has contracted to deliver 372,312 tons of coal to points outside the state and 105,725 to points within the state, it is alleged.

**The Interstate Commerce Commission** has suspended until March 28 next the operation of schedules on the Louisville & Nashville R.R. which provide for a uniform increase of 20c. per net ton in the rates on coal from points on the Cumberland R.R. to points on the L. & N. in Alabama, Georgia, Illinois, Indiana, Kentucky, North Carolina, Ohio, Tennessee and Virginia, and on connecting lines in Kentucky and Tennessee.

## Personals

**E. Kelly Downey,** former manager of the coal department of B. Nicoll & Co., has been appointed general manager of sales by Dexter & Carpenter, Inc.

**Fred W. Virgien** has resigned his position with Whitney & Kemmerer to become assistant manager of the New York office of the Producers Fuel Co.

**Walter S. Morgan,** of the Rutledge & Taylor Coal Co., who has heretofore been salesman out of the St. Louis office of the company, has recently been transferred to the Chicago offices of the company.

**Richard H. Williams** has been re-elected a Class B director of the Federal Reserve Bank of New York, for a term of three years beginning on Jan. 1. Mr. Williams is senior partner of William & Peters, wholesale coal dealers at No. 1 Broadway. He is a director and member of the executive committee of the Equitable Life Assurance Society, a director and member of the finance committee of the Atlantic Mutual Insurance Company, and a director of a number of other corporations.

**H. I. Smith,** a coal mining engineer formerly with the Bureau of Mines, has returned to the service of that bureau after having served in Serbia as a member of the American Commission to that country. It is probable that Mr. Smith will be sent to Denver as an inspector of coal land leases.

**E. C. Pratt** and brother, **B. A. Pratt, of** the Republic Coal Co., Minneapolis, have secured a tract of land in Cass County, Texas, which they propose to develop for iron ore.

The lately organized Maxim Coal and Coke Corporation of Buffalo has elected the following officers: **L. P. Zimmerman,** president; **F. A. McCarthy,** vice-president; **D. J. McCarthy,** secretary and treasurer. The active members were formerly connected with the North American Coal & Coke Corporation.

**A. F. Harper,** formerly Mining Engineer with Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., has been appointed Superintendent of the Ruffner Ore Mines Division of the same company at Irondale, Ala.

**Miss Anita R. French** has been appointed comptometer operator in the coal section of the division of mineral resources, Geological Survey. She was formerly with the Treasury Department and spent nearly two years overseas with the A. E. F.

**Ray S. Linzee,** for over twenty years a member of the First Bank & Trust Co., of Duquoin, Ill., has announced his resignation from that institution to become connected with the Jewel Coal & Mining Co., of St. Louis, in its Duquoin offices.

**Arthur Neale** of the Pittsburg Coal Co., operating in Illinois now owned by the Illinois Coal & Coke Co., has left for Pittsburg, Pa., where he will be assistant general manager of the Pittsburg Coal Co.

**Fritz J. Frank,** vice president of the Iron Age Publishing Co., has been elected president of that company, following the resignation of William M. Taylor, who has been president and general manager for more than ten years.

**A. K. Morris** who has recently assumed the duties of Vice-President of the Pennsylvania Coal Co, having resigned as coal traffic manager of the Erie Railroad Co., was connected with the local office of the Federal Fuel Administration during the war. Mr. Morris will make his headquarters at Dunmore, Pa.

The space occupied by W. A. Marshall & Co. on the 8th floor of 25 Beaver St., New York City, has been increased by the addition of two large rooms. The export department, in charge of **F. J. Kerner,** will occupy the additional space. **Clarence W. White,** who was formerly connected with Madeira, Hill & Co., at 143 Liberty street, is now a member of the bituminous Tidewater staff of Marshall & Co.

**George W. Conners, S. L. Yerkes** and **W. C. Adams** have been appointed a committee of the Alabama coal operators to raise funds to defray a substantial portion of the $37.500 required for the purchase of the site of the $400,000 coal terminal at Mobile.

**P. C. Sullivan** has been appointed Fairmont representative of the Equitable Fuel Co. of Baltimore.

**Gordon B. Late** has been named as the Fairmont representative of the Seaboard Fuel Corporation of Philadelphia.

**W. E. Guller,** formerly chief engineer for the Shoal Creek Coal Co. at Panama, Ill., has accepted a position with the Donk Bros. Coal & Coke Co. as chief engineer and assistant general superintendent. Mr. Guller will make his headquarters in Edwardsville, Ill.

**H. S. Drake,** formerly with the Clarkson Coal Mining Co., Cleveland, Ohio, has joined John Mahony & Co., Certified Public Accountants, of Illinois, as manager of their Des Moines office in charge of business in Iowa.

## Industrial News

**Nashville, Tenn.—The Nashville Industrial Corporation,** composed of business men of Nashville, have purchased from the U. S. Government the "Old Hickory" Powder Plant at Jacksonville, located 12 miles east of Nashville, on the navigable Cumberland river. The purpose of the Nashville people is to industrially develop this immense war undertaking into a large manufacturing center, having available immense housing and manufacuring buildings and facilities.

**Toledo, Ohio**—The Central West Coal & Lumber Co. of Columbus has opened a branch office at 730 Nicholas Building, with A. B. Wilson in charge as manager.

**New York, N. Y.**—The Central Pocahontas Coal Co., has removed its main office to 32 Broadway.

**New York, N. Y.**—The West Penn Fuel Co, Inc., announces the opening of a New York office, Suite 810, No. 150 Nassau St., district manager, Frank W. Casler.

## Coming Meetings

**American Institute of Mining and Metallurgical Engineers'** annual meeting will be held in New York, Feb. 14 to 17, 1921. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

**The Wholesale Coal Trade Association of New York, Inc.,** will hold its annual meeting in New York City, Jan. 18, 1921. Secretary, Charles S. Allen, 90 West Street, New York City.

**American Society of Civil Engineers** will hold its annual meeting Jan. 19 and 20, 1921, at its headquarters, 33 West 39th St., New York City. Acting secretary, Herbert S. Crocker, 33 West 39th St., New York

**American Statistical Association** will hold its annual meeting Dec. 29 and 30 at Atlantic City, N. J., with headquarters at The Chalfonte. Secretary, Robt. E. Chaddock, Columbia University, New York City.

**American Economic Association's** thirty-third annual meeting will be held at Atlantic City, Haddon Hall, Dec. 27-30. Coal papers will be read at the Monday evening session, starting at 8 o'clock and Tuesday morning at 9:30. Secretary, R. B. Westerfield, Yale University, New Haven, Conn.

## Recent Patents

**Grease Cup.**—Eli W. K. Burg, Toledo, Ohio, 1,348,362. Aug. 3, 1920. Filed Dec. 12, 1917. Serial No. 206,827.

**Conveyor.**—W. J. Voelker, Waterloo, Iowa, 1,348,671. Aug. 3, 1920. Filed June 2, 1919. Serial No. 301,166.

**Pulverized Fuel-Burning Device.**—John Dickson, Vancouver, Wash., 1,349,148. Aug. 10, 1920. Filed July 28, 1917. Serial No. 183,341.

**Mine Pulley or Roller.**—James Boyd Anderson, Philadelphia, Pa., 1,349,183. Aug. 10, 1920. Filed Feb. 3, 1920. Serial No. 356,087.

**Separator for Treatment of Coal, Clays, Ores and the Like.**—John M. Draper, Bridgend, Eng., 1,351,234. Aug. 31, 1920. Filed Feb. 4, 1919. Serial No. 274,836.

**Squirrel-Cage Winding Construction.**—Nathan Wilkinson, Milwaukee, Wis., assignor to Allis-Chalmers Mfg. Co., Milwaukee, Wis., 1,351,270. Aug. 31, 1920. Filed Aug. 27, 1914. Serial No. 859,121.